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A SURVEY OF SOUTHWESTERN ARCHAEOLOGY[1]

By FRANK H. H. ROBERTS, JR.

SOUTHWESTERN archaeology has long occupied a prominent place in North American anthropological researches, but at no time since investigations were started has there been as widespread an interest or so marked a diversity of effort in the area as that of today. Intensive studies and numerous conferences have produced so much material that it is difficult for those not directly concerned with the field to keep abreast of its developments. Several articles, reports, and books on the Southwest appearing in recent months review the archaeology in an effort to explain the present status of the subject. There is still some misconception, however, about various phases of the problem and a number of features, particularly earlier contributions, have been so consistently overlooked that an additional résumé may not be out of place.

Early Spanish explorers observed and recorded ruins which lay along their routes of travel, but it was not until reports by members of military and survey parties of the westward expanding United States became available that a real interest was aroused in the remains which dot the region. Universities and museums were attracted to the field and private individuals organized expeditions to hunt for "relics." From that time onward there has been an ever increasing zeal on the part of diggers. When the eastern tourists "discovered" the Pueblo country a decade ago the Southwest became archaeologically conscious and began to capitalize its antiquities. Local schools and colleges introduced courses on the subject in their curricula and small societies and roadside museums sprang up all over the area. Most of the investigations in former years were conducted by large institutions located outside the region, but the local organizations are now doing their full share. Last winter and early spring the landscape literally swarmed with "archaeologists" sponsored by the CWA and during the summer the activity continued under the FERA. The results of most of this work are still to be determined, although the general consensus of opinion

[1] Submitted by permission of the Secretary of the Smithsonian Institution.

is that, with a few exceptions, it was unfortunate that "relief employment" was directed into that particular channel.

Hundreds of articles and reports have been written on Southwestern archaeology. Many of the papers are excellent, others indifferent, and some should never have attained to the dignity of print. On the other hand much work has been done which was never reported and, unfortunately, some of the most important excavations ever carried on fall in this category. From a broad point of view the published data fall into three main classes: graphic accounts of the superficial features of greater and lesser antiquities; detailed studies of buildings and objects found, with considerable emphasis on the function and symbolism of the latter; and comprehensive treatises on specifically planned investigations in an attempt to fit the data into their proper position in the historical pattern and to show what part they played in the course of cultural development in the area. The style of report correlates roughly with the series of years in which the work was done. The first belongs to the era of exploration, 1850 to 1880; the second to the interval of promiscuous digging with specimens as the chief incentive, 1880 to 1910; and the last to the period of excavations carefully planned with a view to solving recognized problems, 1910 to the present. This grouping may be criticized on the grounds that a few of the earlier men did endeavor to see the picture as a whole, while some now engaged in researches seemingly do not realize that there is more to the problem than their own little project. But, taken by and large, the three-phase classification does indicate what the trends have been.

That all of the ruins were not contemporaneous was suggested by various factors. Yet, although there was a broad classification of modern and pre-Spanish remains, little attempt was made to determine sequential distinctions between sites until about 1910. Prevailing opinion was that no such differences could be ascertained for the pre-Spanish group. This belief was strengthened by the unsatisfactory results which most of the workers obtained when they endeavored to develop a sequence on the basis of legendary evidence, by comparisons between artifacts, and by the state of preservation of the ruins. For some reason stratigraphy was largely disregarded despite the fact that it had long proved extremely useful in Old World archaeology. Not a few investigators held, and students were even taught, that there could be no stratigraphy in the Southwest because the remains were only those of a single people, the Indian.

Stratigraphy was recognized in a few sporadic cases as indicating relative dates for material, but it was not until the present phase of Southwestern researches that it received due consideration as an important

source of evidence. N. C. Nelson of the American Museum of Natural History demonstrated the validity of the method when, beginning in 1912, he used it in New Mexico. He, as well as other field men, had recognized variations in the kinds and styles of pottery associated with ruins and village sites and believed that these differences had definite significance beyond that of being characteristic of the places where they were found. Accordingly he chose a number of ruins known to be inhabited pueblos during the early Spanish occupation. By working downwards from top to bottom in the adjacent refuse heaps he determined the sequence of the principal pottery types of the Rio Grande region and in consequence the main chronological periods for the district.[2] At about the same time Kidder and Guernsey were using stratigraphy to establish the relative ages of several types of remains in the Kayenta district of northeastern Arizona. Subsequent projects, Morris at Aztec, Hodge at Hawikuh, Kidder at Pecos, Judd in the Chaco Canyon, were conducted with full consideration of the importance of this kind of evidence. Since that time stratigraphy has become one of the accepted routines in the technique of excavation.

To aid him in the study of his material Mr Nelson developed a system of tabulations and percentages which not only showed fluctuations in the pottery from a single site, but which proved of value in making comparisons between the types found at various ruins. Kidder employed an adaptation of the method at Pecos,[3] Kroeber used it successfully in the Zuñi region,[4] and Spier obtained excellent results in a survey of the Zuñi and Little Colorado districts by following an elaborated form of it.[5] Briefly stated, the technique makes possible a relative dating of sites on the basis of the percentages of the different kinds of pottery found at each, provided the ceramic sequence has previously been determined by stratigraphy. The method was used for some time with good success by workers in the Southwest. Recently, however, it has fallen into the discard. Just why this should be the case is not apparent. It is true that under certain conditions it is not an infallible source of evidence, particularly in chronological studies based solely on surface material. Nevertheless it is helpful in outlining the main characteristics of a district and in indicating where intensive work should be undertaken. In a study of the ceramics of a single site it has more than enough merit to warrant its retention in archaeological procedure. It graphically demonstrates the true nature of the pottery com-

[2] Nelson, 1916.
[3] Kidder, 1931. (See also American Anthropologist, Vol. 19, pp. 325–60.)
[4] Kroeber, 1916.
[5] Spier, 1917, 1918.

plex. One explanation for the failure to make use of the system is, perhaps, that the workers have become so absorbed in a detailed study of pottery *per se* that they have forgotten the important factor of giving percentages. It is only from such data that the real significance of each group in the series can be judged.

Accumulated data had demonstrated that there were regional variations, that characteristic cultural elements tended to conform to distinct patterns or styles according to the district in which they were found. It was also observed that the stylistic complexes seemed to radiate from particular centers and that they mingled or overlapped along the hazy boundary lines separating the numerous spheres of influence. Moreover, it was definitely established that there were a number of different stages in the unfolding of the culture. Although writers described these features, little attempt was made to combine the knowledge into a coherent whole until Nelson undertook a chronological study of the entire area. He had drawn up a diagrammatic chart to illustrate his conception of the relations between the various groups, as well as their origins, but had not completed his work when his efforts were diverted to other fields.[6] Nelson's outline broadened the viewpoint to a considerable degree, but it was not until Kidder published his "Introduction to Southwestern Archaeology" in 1924 that the possibilities for revealing a vivid and fascinating narrative of culture growth were fully appreciated. Kidder not only assembled, digested, condensed, and made available the salient facts of existing data, he went further and correlated the mass of information into an historical reconstruction presenting for the first time a comprehensive postulation of developments in the area. The book had an even greater value, however. It pointed out blank spots in the record, indicated districts where investigations were needed, and centered attention on a number of general problems.

Within the last decade a new method making possible absolute rather than relative dating became available. This contribution came from an astronomer. Dr A. E. Douglass of the University of Arizona, in studying sun spots and their effects on climatic conditions, turned to the growth rings of trees in an effort to obtain evidence on the occurrence of drought periods and the intervals of moisture. In doing this he discovered that definite ring patterns recorded specific year groups and as a consequence developed a system whereby he can tell the year when a log was cut from a living tree. Beginning with trees whose actual cutting date was known he

[6] Nelson, 1919, 119.

has been able to devise a type ring chart going back to about 700 A.D.[7] In securing evidence to substantiate his own theories he was forced to resort to timbers from ruins for material antedating living trees and thus furnished the archaeologists with a valuable time scale. When beams are found in ruins it is possible to check their rings against the type chart and, provided the outer surfaces have not been damaged or removed, tell the year of their cutting. The timber may not have been placed in the structure immediately after it was cut and an occasional log was reused, but such factors can be checked by the archaeological aspects of the site and a date is assured which approximates closely the year or years when the dwellings were erected.

Continued work with the tree-ring dating system, or dendrochronology as it is now called, demonstrated that the type chart would not function in all cases. Material from some sections did not correlate properly because of local variations in characteristic ring patterns. For this reason it has been necessary to develop supplementary charts. The work is being carried on by a number of Doctor Douglass' students and newly dated ruins are constantly being added to an already sizeable list. Rivalry between the workers to find earlier and earlier dates has in one or two instances caused misunderstandings. Proper use of the system requires that the announced date should be that of the outermost ring in the timber. Occasionally the date of the earliest discernible ring has been proclaimed in such an ambiguous way that the implication was that that was the year when the log was cut and the building erected. One such case led to numerous articles attributing some 200 years greater antiquity to one major ruin than it actually possesses. This not only created an erroneous idea about the age of the site, but caused considerable confusion since nearby structures believed to be contemporaneous, on the basis of archaeological evidence, had yielded much later dates. Peculiar inconsistencies in some recent identifications and interpretations of material have led a number of those specializing in dendrochronology to the formulation of an agreement that each date and the specimen on which it is based be examined and approved by Doctor Douglass before it is released for publication. Great care should unquestionably be taken because the results so definitely fix the chronological position of a ruin that an inaccuracy might disrupt the sequence for an entire district. A gratifying feature about dendrochronology is that its results have checked with the findings from other sources of evidence. The relative ages of numerous large ruins and village sites, even of remains in

[7] Douglass, 1929, 1932.

different districts, had been worked out by archaeological methods and when tree-ring dates became available it was noted that the previous conclusions were in agreement, although the estimated time lapses had been much too great.

As a result of the stimulation of interest produced by Kidder's book, the entrance of new workers into the field, an increase in published material, and growing confusion in the correlation of information, it became apparent that something should be done to improve the situation. Accordingly, Doctor Kidder invited workers in Southwestern archaeology and related fields to an informal conference at the excavation camp at Pecos Ruins, New Mexico, August 29–31, 1927. The three days of discussions led to an agreement on a series of sequent stages in the culture growth and a set of names designating the several phases, the Pecos Classification, were adopted. This conference was so satisfactory to the workers that most of them met at Pecos again in the summer of 1929. The sessions of the second gathering were devoted mainly to a review of the original classification and to reports on excavations conducted subsequent to the first conference.

Most of those attending the second conference expressed the belief that the classification had been of help to them in their studies. Some stated that they had difficulty in applying the criteria. This was especially true of one definite region. Consideration of this perplexity served to emphasize a fact which had been becoming more and more apparent. Namely, the remains in the southern and western portion of the area, the desert domain, are not Puebloan in type. Cosmos Mindeleff commented on this in 1896 and suggested that the differences were too marked to be attributed wholly to a question of environment.[8] Kidder in 1915 separated Southwestern culture into two major divisions on the strength of the dissimilarities[9] and he again pointed them out in 1924. In the latter publication, however, with pottery as the criterion, he concluded that in some respects these aberrant sites were allied to the Pueblo ruins.[10] Nelson had recognized the distinction and in 1919 indicated it on his diagrammatic chart, although he did not give a detailed discussion of the problem. The situation was not accorded the attention which it merited, actually was overlooked at the first conference, until Gladwin and others, beginning in 1927 and continuing through subsequent years, secured definite evidence that the types are different. The

[8] Mindeleff, 1896, 186–87.
[9] Kidder, 1917.
[10] Kidder, 1924, 105–6, 107.

full import of this did not crystallize at Pecos but at Gila Pueblo, Globe, Arizona, in April 1931, when a classification was drawn up for that division. The results of the Gila Pueblo conference were presented to a larger group of Southwestern workers at the Laboratory of Anthropology, Santa Fé, New Mexico, in September of that year. The Santa Fé session, which took the place of the biennial Pecos conference in 1931, discussed and adopted the Globe recommendations. There have been no general meetings of that nature since.

From the knowledge secured during the many years of investigations and on the basis of understandings reached in various conferences, most Southwestern archaeologists today synthesize the data broadly and briefly as follows. Scattered over the area are the remains of a basic sedentary, agricultural, pottery-making culture which has two major provinces comprising the plateau and desert patterns. The plateau division, which falls under the Pecos Classification, includes the regions of the San Juan, the Rio Grande, the Upper Gila and Salt, the Little Colorado, most of Utah and a portion of eastern Nevada. The desert domain, summed up by the Globe Classification, occupies the territory extending from the Colorado River on the west to the Rio Grande on the east; from Flagstaff, Arizona, on the north to northern Sonora on the south; with its center lying in the middle Gila basin. The northern boundary follows roughly the 35th parallel from the Colorado, swinging slightly north to include the Flagstaff section, thence southeastward across Arizona conforming approximately to the great diagonal ridge sometimes called the "Mogollon Rim" or the "Verde Breaks," continues along the Gila Mountains and swings eastward into New Mexico. There is, of course, an overlapping of the patterns in the border precincts, but only in late phases any indication of fusion. In only one district, the Verde Valley, do the two appear to have coalesced to form a sub-pattern.

The plateau group is designated by the long familiar names, Basket Maker-Pueblo, while the desert dwellers have been termed the Hohokam, a word used by the Pima when they make reference to the ancient ones. Russell employed it in an archaeological sense when he referred to the antiquities of the region in his monograph on the Pima. It was not adopted or generally used, however, until after the meeting at Gila Pueblo. The Hohokam for a number of years went under the working designation of the Red-on-Buff culture because of the color characteristics of its pottery. In considering the two major divisions the Basket Maker-Pueblo with its so-called Pecos Classification will be discussed first.

BASKET MAKER-PUEBLO

The uplands pattern is recognized as representing a cultural unit with several horizons in its development. The general view is that agriculture, introduced from the south, was taken up by a nomadic people whose newly acquired art led to a more settled life. At a later date pottery making was either introduced or invented and houses of the pit type were perfected. This was accompanied by changes in existing elements in the material culture and the appearance of other features. A new racial strain then invaded the region, dwellings were built above ground and evolved into many-roomed structures. With the infusion of new blood there was an acceleration in the unfolding of the cultural pattern. Small villages were scattered over a greater part of the province. Then there was a contraction in the extent of occupied territory and a concentration of population into definite centers. This phenomenon was accompanied by improvements in architecture and the ceramic arts, together with marked local specialization. Following this there was an even greater shrinkage in occupied territory, a shift to new localities, and a decline from the preceding cultural peak. This trend was terminated by the arrival of the Spaniards and subsequent colonization by other white men.

The first Pecos Conference grouped the various horizons under two main headings, the Basket Maker and the Pueblo, which were further divided. Hence the Basket Maker I, or Early Basket Maker; Basket Maker II, or Basket Maker; Basket Maker III, Late Basket Maker or Post-Basket Maker; Pueblo I, or proto-Pueblo; Pueblo II; Pueblo III, or Great Period; Pueblo IV, or proto-Historic; Pueblo V, or Historic. These eight stages in the general pattern were based on several diagnostic traits. For the two major groups skeletal material is significant. In the material culture the following elements were believed to be indicative of the various stages: village types, architecture, sandals, pictographs, textiles, stone and bone implements, kinds and styles of ornaments, and pottery. Pottery, it was agreed, furnished the most abundant, convenient and reliable criterion, and the culinary vessels the simplest ware for chronological determinations. Primarily the classification rests on ceramics. One explanation for this is that pottery (potsherds) is readily obtainable without the expenditure of much effort or money. Also, it is characterized by easily noted differences in style and form and it was an exceedingly sensitive element from the standpoint of variations both in time and place. When the first conference was held only a little was known about the houses and still less about other factors for some of the early stages. The original summarized classification

has been so widely published that it need not be repeated in detail.[11]

For the benefit of those not thoroughly familiar with the subject a brief consideration of certain elements in each horizon may help to an understanding of the sequence. This summary includes not only the material available when the nomenclature was adopted but data obtained since 1927 as well. Discussion of all of the components of the complex for each subdivision is beyond the scope of the present article so only a few traits will be described. Since Basket Maker I is postulated there is little to be said concerning it. Theoretically it was a non-agricultural stage possessing in cruder, less developed form some of the elements present in later levels but actually no traces of it have ever been found. When the first tabulation was made recent finds suggested that such had been discovered. Subsequent study of the material, however, indicated that it could not be considered in that light. A number of the discoveries in recent years which indicate human occupancy of the area at a comparatively remote date can not be considered, on present evidence, as representing the initial stage of the classification. These finds, Folsom,[12] Gypsum Cave,[13] etc., thus far have not been shown to bear any relationship to the Basket Maker. The most significant factor in this connection was the discovery by E. B. Howard of a Folsom type point in a level underlying a Basket Maker horizon.[14]

Crania

Basket Maker II, undeformed, long scaphoid. Basket Maker III, undeformed, long scaphoid; undeformed round (occasional in late sites). Pueblo I, deformed, both long and round. Pueblo II, deformed, round in the majority; an occasional long. Pueblo III, deformed, preponderantly round; sporadic long. Pueblo IV, deformed, mostly round; few long. Pueblo V, deformed, round and long. Undeformed round; occasional undeformed long.

Sandals[15]

Basket Maker II, square toe with fringe, twined-woven of fine cord. Basket Maker III, scalloped toe, woven of fine string, design in color on upper side, woven pattern on under. Pueblo I, round toe, woven of fine string, coarse pattern on under side. Pueblo II, round toe (?). Pueblo III, notched toe, woven of fine string and yucca leaf; square toe, yucca leaf, twilled weave. Pueblo IV, notched toe, string and yucca leaf. Pueblo V, moccasins.

[11] Kidder, 1927; 1931, 5–6; Roberts, 1929, 3–7.
[12] Cook, 1927, 1928.
[13] Harrington, 1933.
[14] Howard, 1932.
[15] Guernsey and Kidder, 1921; Guernsey, 1931.

Basketry[16]

Basket Maker II, loose-weave, coiled, rod and bundle type; decorated in black or red. Basket Maker III, coiled rod and bundle type, no difference either in technique or appearance from Basket Maker II; occasional irregular splitting of stitches. Pueblo I, coiled rod and bundle, elaborate designs; twilled-ring baskets. Pueblo II, twilled-ring baskets; general lack of information, however. Pueblo III, occasional coiled, rod and bundle with fine tight weave but no design; twilled-ring baskets numerous. Pueblo IV, same as for III, wickerwork appears. Pueblo V, baskets of plaited yucca leaves attached to wooden rims; coiled rod and bundle baskets and trays; wickerwork baskets.

Textiles[17]

Basket Maker II, twined-woven bags with designs in color, finely woven from apocynum-fiber string; coiled-netted weave of human-hair string. Basket Maker III, twined-woven bags of coarse weave with no design; coiled-netted weave of coarse-fiber string. Pueblo I, cotton cloth. Pueblo II, cotton cloth. Pueblo III, cotton cloth of plain loom weave; elaborately decorated loom weave; netted weave. Pueblo IV, same as for III. Pueblo V, cotton, wool, commercial items purchased from the traders.

Weapons[18]

Basket Maker II, atlatl, grooved clubs. Basket Maker III, atlatl, grooved clubs, bow and arrow towards end of horizon. Pueblo I, bow and arrow. Pueblo II, bow and arrow. Pueblo III, bow and arrow, throwing club. Pueblo IV, bow and arrow, throwing club. Pueblo V, bow and arrow, throwing clubs, European weapons.

Houses

Basket Maker II, no information; possibly erected temporary shelters in the open. Dug into floors of caves are circular or oval pits, in many cases lined with slabs of stone, which constituted lower portions of granaries. Now and then examples are found with pole, brush and plaster superstructures still in position over pit. Occasionally these cists were lined with bark and grass and seem to have functioned as sleeping places.[19]

Basket Maker III, dwellings of the circular, oval or rectangular pit variety. Excavations lined with upright stone slabs or heavy coating of mud plaster or both, sometimes a wainscoting of poles was used in place of stone. Roofed over with a conical or truncated superstructure of poles covered with mats or brush, plaster

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[16] Guernsey and Kidder, 1921; Guernsey, 1931; Weltfish, 1932.
[17] Guernsey and Kidder, 1921; Kidder and Guernsey, 1919; Guernsey, 1931.
[18] Guernsey and Kidder, 1921; Guernsey, 1931.
[19] Guernsey and Kidder, 1921; Nusbaum, 1922.

and earth. Central smoke hole, side entrance passage, occasional ante-chamber. Granaries of Basket Maker II form clustered about houses. Number of such dwellings irregularly grouped together to form a village.[20]

Pueblo I, characterized by transitions in house types, variety of structures. In the north central section of the province, the portion traversed by the San Juan and its tributaries, the crude, single-roomed semisubterranean dwellings gave way to structures which had only slightly depressed floors instead of pits. Major portion of house was above ground. Had several contiguous rooms. Pole and plaster form of construction, jacal walls, prevailed at first but was replaced in time by masonry. Pit domiciles continued in use in peripheral districts, especially in the south and west. Pits were dug deeper, however, and entrance to chambers was by means of a ladder through the smoke hole. In a few precincts the side entrance survived. Where entrance was through the roof the former side passage was retained in reduced size as a ventilator. Above ground villages retained a subterranean structure as a ceremonial house, the kiva.[21]

Pueblo II, unit-type structures or one-clan houses. These dwellings of stone or adobe, built entirely above ground, contained from six to fourteen rooms. They were a single story in height with rooms grouped in one long row, a double tier, an L-shape, or in the form of a rectangular U. Usually at the south or southeast side, detached from the building, was a subterranean ceremonial chamber.[22] In peripheral parts of the area this type of dwelling did not reach as high a degree of excellence. Pole and mud houses and irregular agglomerations of rooms whose walls were formed from large quantities of adobe mud and unworked bowlders prevailed in the south and west. In the Flagstaff district rectangular pit dwellings survived through this horizon.[23]

Pueblo III, the great terraced communal houses of many rooms; mostly of stone construction although occasionally made of adobe. Erected either in the open or in large natural caverns in the cliffs. Also, one-clan houses scattered about in the vicinity of the large centers. In some sections cavate dwellings, rooms cut into the soft tufa of cliff faces, were not uncommon.[24]

Pueblo IV, communal houses, scattered dwellings, cavate lodges.[25]

Pueblo V, villages of terraced houses, of one-storied single-family houses, scattered single-family dwellings. Numerous examples of this stage are known to the general public, Taos, Zuñi, Acoma, and the Hopi towns especially.

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[20] Guernsey, 1931, 25–27; Roberts, 1929, 10–105.

[21] Kidder, 1924, 74–75; Morris, 1919, 182–95; Roberts, 1930, 19–73; 1931, 15–90.

[22] Prudden, 1903. These structures illustrate the form but are Pueblo III in horizon. A number of examples have been excavated in the Chaco range but data are unpublished.

[23] Colton and Hargrave, 1933.

[24] The works of Fewkes, Pepper, Mindeleff, Hough, and numerous others illustrate this horizon. See bibliography in Kidder, 1924; also citations in Roberts, 1932, 17–19.

[25] Roberts, 1932, 20–21, for examples.

POTTERY

Basket Maker II, no true pottery but large containers of unfired clay tempered with cedar bast, the chaff of corn tassels or grass heads. Moulded in baskets or built up of clay, the beginning of the coiled technique.[26]

Basket Maker III, fired vessels. Light gray to a fairly good white in color; red containers; bowls with an unpolished black interior and gray exterior. Surfaces irregularly stippled in appearance due to protruding particles of tempering material. Sand or crushed rock temper, paste granular in cross section. Red ware due to an intentional overfiring, rarely to colored slip. Bowls usually decorated on interior, other vessels unornamented. Designs generally ribbon-like panels embellished with dots, zigzag and stepped-line elements, occasional life-form figures. Decorations carried over from basketry to pottery. Most vessels treated, after firing, with a wash of red pigment. This is impermanent and has been called "fugitive red." Culinary vessels smooth on the exterior.[27]

Pueblo I, plain gray, black on white, lustrous black on red, slightly polished black interior bowls with brownish exterior. Introduction of slip. Tempering of white sand, ground rock, or pulverized potsherds. Decorations on all types of vessels. Main design elements consist of zigzag, parallel, parallel-stepped lines, and wavy lines; filled triangles and dotted triangles; volutes and ticked volutes; interlocking frets; checkerboard; concentric rectilinear and curvilinear figures. Patterns taken from textiles in addition to baskets. Culinary vessels with corrugated necks, flat neck bands, and smooth bottoms. Period marked by great diversity in form. In the black on white ware there are two main groups, the eastern and the western. Of course there are many local minor variations but for a general consideration the two main forms are sufficient. The eastern centered about the Chaco Canyon area and the western around the Kayenta district in northeastern Arizona. The eastern extends from the northeastern San Juan basin in southern Colorado to the Upper Gila region in southern New Mexico, from the Rio Grande on the east to approximately the Arizona-New Mexico boundary line on the west. In the west its southern fringes penetrated somewhat into Arizona. The western Pueblo I ranged from northeastern Arizona to the Little Colorado in the eastern part of the state, swung a bit south of that stream farther west, and continued across to southeastern Nevada. The eastern borders are not sharply defined and there is a strip extending down the Arizona-New Mexico line where the two phases overlap. The western was the first to be recognized and for a long time was thought to be the characteristic form. Later investigations in the Chaco Canyon and the northeastern San Juan region established the second and what appears to be the most widespread division. The basic difference is twofold, pigment used in the decoration and surface treatment. The eastern phase had an iron-carbon paint, the western carbon. The eastern group applied the pigment after the surface of the vessel was polished. The western

[26] Morris, 1927, 138–60.

[27] Morris, 1927, 161–98; Roberts, 1929, 107–26.

painted the design before the polishing process was completed, hence it seems to fade into the surface of the vessel. In the eastern form it stands out from the slip. There is no difficulty in telling one from the other or in recognizing either as Pueblo I because the general style of decoration is the same for both.[28] The culinary vessels, red and blackened interior bowls, are the same in the two divisions.

Pueblo II, gray ware, black on white, lustrous black on red, polished black interior bowls with reddish exterior. Ground rock tempering, some sand, powdered potsherds. Decorations on all kinds of vessels. Painted designs characterized by broad, heavy elements; some survival of Pueblo I features but without series of bordering parallel lines. Culinary vessels with indented corrugations on necks, smooth bottoms, or plain corrugation over entire surface. Indented corrugation large and coarse, frequently called "exuberant." Simple form of design pinched into corrugation or incised with finger nail or implement. The beginning of spiral coil. In previous stages each loop of clay made only a single circuit while in Pueblo II longer fillets were employed and each made several turns around the wall of the vessel.[29]

Pueblo III, gray ware, black on white, polychrome, black interior and red exterior. Late in period the beginning of black on yellow, black on orange. Fine texture, potsherd tempering as a rule. Designs characterized by elaborate detail and fineness of execution. The era of marked specialization. Pottery of the various districts so typical that its place of origin may be recognized immediately, whether Mimbres, Chaco Canyon, Kayenta, etc. Culinary vessels covered over entire exterior surface with finely indented corrugation. Continuous spiral coil in manufacture.[30]

Pueblo IV, plain gray, plain yellowish, black on white, black on red, black on yellow, black on orange, polychrome, and glazed wares. Sand and potsherd tempering. Elaborate designs, solid heavy elements. Breakdown in corrugation on culinary vessels, beginning of return to smooth surfaced cooking pots.[31]

Pueblo V, modern painted wares of the Pueblos. Smooth surfaced culinary vessels.[32]

Other Traits

There are a number of traits which are more or less distinctive of one period or occur in several, but which are not continuous throughout the pattern. Basket

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[28] Kidder, 1924, 74–76, Western (called pre-Pueblo); Guernsey, 1931, pls. 59, 60, 61, Western; Roberts, 1930, 74–139, 1931, 114–49, Eastern.

[29] Guernsey, 1931, pls. 42, 43, 66; Hargrave, 1932, 12, Coconino gray; 14, Deadman's corrugated; 15, Deadman's black on white.

[30] Kidder, 1924, 51–74; Cosgrove, 1932; Hargrave, 1932; Roberts, 1932, 18–19 for additional references.

[31] Kidder, 1924, 86–87; 1931: Hargrave, 1932: Roberts, 1932, 20–21 for additional references.

[32] Bunzel, 1929; Kidder, 1931, 131–50.

Maker II has tree-shell trowels or characteristic wooden scoops, peculiar lozenge-shaped beads, button hole stitch on selvage of plain-weave cloth. Basket Maker III a cross-stick spindle and a unique type of small globular pot with lateral spout. Basket Maker II-III have small funnel or nipple-shaped unfired clay objects either plain or decorated with a punctate design, also clay figurines usually representing human females.[22a] Basket Maker III and Pueblo I-II have the open end trough metate placed on the floor, Pueblo III-V flat metates set in bins. Pueblo I-V have the domesticated turkey and the polished grooved ax. Pueblo IV has pottery with the designs in glaze. There is always the possibility that something from an earlier stage will appear in one of the later horizons. This may be a continuance, a revival of an older form, or an actual survival of one or more objects. Even among the Indians there are and were devotees of the "antique" and the archaeologist occasionally stumbles upon a choice lot of objects which belonged to such a person. It should be evident that allowances must be made for occurrences of this kind but, as is so often the case, the obvious is so frequently overlooked that attention needs be called constantly to the fact that archaeologically "once a thing has been it will be again and again."

As an illustration of the time element involved and in response to oft repeated queries concerning the age of ruins, a number of writers have supplied dates for the various stages in the sequence. These were not an integral part of the Pecos Classification, with the exception of Pueblo V, and were not given with the idea of isolating each stage between definite sets of years, because there is no sharp break between periods. Insofar as possible these dates were based on information furnished by dendrochronology. For earlier stages, however, data from this source were not available and the figures were speculative. Most reports stressed this factor and pointed out that there could be no hard and fast application of the numerical chronology. A tendency has developed in certain quarters to make these dates the horizon determinant and to ignore the elements in the complex. A bare numerical tabulation is not sufficient to make clear all of the ramifications of peripheral lags and stage survivals.

There are two peripheral precincts where the Basket Maker-Pueblo pattern is not clear cut. In these outlying reaches many features of the nuclear districts are missing. On the other hand local developments have contributed elements foreign to the central portions. These marginal regions are generally designated as the Northern and Eastern peripheries. The Northern comprises the territory north and west of the Colorado River, ranging along the western slopes of the Rocky Mountains into southern Idaho and extending westward into eastern Nevada. The Eastern includes

[22a] Morris, 1927, 154–58.

the territory lying to the east of the Rio Grande drainage and extends from the Oklahoma panhandle on the north through western Texas to the Big Bend district on the south. The western and eastern boundaries of the two peripheries, respectively, have not been determined.

The Northern Periphery is characterized by a progressive fading of the basic pattern in proportion to the distance from the central portions of the province. The general nature of the remains indicates a Basket Maker III-Pueblo I origin for a complex which has distinctive qualities resulting from a combination of factors. Among these may be noted the survival of early elements, varying rates of diffusion for important features in the main pattern, the synchronous appearance of components which were chronologically distinct in the nuclear districts, the adaptation of borrowed features to local needs, and inventions. Except for a narrow strip along the Colorado River in the southern part of the periphery where the pattern was closely allied to that of northern Arizona, the grooved ax, the grooved maul, sandals, the domesticated turkey, cotton, and various pottery forms are missing from the complex. Local features rare or absent in the central phases are a peculiar type of moccasin called the Fremont, unbaked-clay figurines in later horizons, the Utah type metate, katcina-like petroglyphs, and pottery ornamented with certain kinds of appliqué decorations. In the outer fringes of the periphery the Basket Maker-Pueblo pattern came to an end, due in large part to pressure from nomadic peoples, at approximately the termination of Pueblo II in the main part of the province. Along the Colorado River it continued well into the Pueblo III horizon.[33]

The general features of the Eastern Periphery, except for the Pecos district, are not as well known as those of the Northern Periphery. The Pecos ruins, located on the headwaters of the Pecos River, represent the largest eastern outpost of the Pueblo country and, while topographically not of the Rio Grande group, are so considered because of their obvious relationship to the remains of the Santa Fé region. The Pecos ruins proper, as well as the smaller sites in the vicinity, have been extensively studied by Kidder and his associates, and considerable data are available on them. The presence of ruins farther east from the Pueblo country has been known since the days of Bandelier in the late 'eighties, yet little attention was paid to them until the last few years. Eastward from the Rio Grande drainage small sites with black on white pottery occur almost to the Texas border. Along the Cimarron in Oklahoma are caves from which material

[33] Steward, 1933.

suggestive of the Basket Makers has come.[34] Basket Maker finds have been made in the Guadalupe Mountains in southeastern New Mexico,[35] and caves in the Big Bend district of western Texas have yielded elements comparable in some respects to Basket Maker.[36] In the Canadian River district of eastern New Mexico and western Texas are the remains of villages which until recently were considered the eastern frontier of the Pueblos. The houses were of stone construction and varied in size from single-roomed circular or rectangular structures to large buildings with numerous chambers of varying sizes and shapes. Because of the crude nature of potsherds found at the small sites they have been identified frequently as Basket Maker III or Pueblo I. As a matter of fact the pottery is of the Plains type and the occasional Pueblo fragment found is intrusive. The larger ruins have yielded Pueblo potsherds indicating a Pueblo IV horizon. General consensus of opinion is that these sites represent the western fringes of an eastern cultural pattern which borrowed Pueblo architecture.[37] On the whole the Pueblo remains of the Eastern Periphery probably do not antedate Pueblo III of the nuclear districts nor postdate the first part of Pueblo IV.

THE HOHOKAM

The Hohokam or desert province is not as well known as that of the Basket Maker-Pueblo because intensive work in the remains of that division is only just beginning. Efforts of investigators have produced good results in the last five years and considerable information is now available, but as yet there is nothing comparable to the mass of data on the uplands province. From what has been learned it is apparent that the desert pattern represents a cultural unit with several developmental stages. Contrary to the Basket Maker-Pueblo, which is considered largely indigenous in its growth, the Hohokam is thought to have entered the Southwest as an already established pattern although it continued to evolve in its new locale. The earliest stage is characterized by a widespread distribution of small villages situated in the broad, semi-arid valleys of the province. This was followed by a horizon in which there was a greater concentration and a withdrawal from the more outlying precincts. Then there was an invasion of peoples from the uplands and typical pueblos were built in Hohokam communities. The two peoples lived together, it seems, yet kept their cultural patterns distinct. The association was apparently of insufficient

[34] Renaud, 1930.
[35] Howard, 1932.
[36] Setzler, 1933.
[37] Holden, 1932.

duration for a borrowing or hybridization of characteristics. The northern people then withdrew from the area while the Hohokam continued to occupy their long established hearths. Comparative studies between dated sites attributable to the group which penetrated the desert domain and then withdrew, and materials which they left in the Hohokam province place the movements between 1300–1350 and 1400–1450 A.D.[38] It is postulated that the Hohokam eventually evolved into the Pima and Papago, although this is still a moot question.

General characteristics of the Hohokam are: dwellings of the single unit type, rectangular in form; agriculture dependent upon extensive irrigation systems; paddle and anvil pottery; cremation of the dead; head form believed to be long and undeformed (this point doubtful because of cremations). The refinement of the pattern has been grouped under five horizons roughly synchronous with the five Pueblo stages. As a matter of fact six levels might be listed because the students of the Hohokam postulate a migratory or pioneer period preceding the first of their defined stages, although no traces of it have been found. As in the case of the Pecos sequence, the Globe Classification rests primarily on pottery. The nomenclature lists the stages as the Colonial, the Sedentary, the Classic, the Recent (given as Degenerate in some reports, but no longer so called), and the Modern. In making a brief summary of the various stages only a few elements in the complex will be considered.

Disposal of the Dead

Colonial, pit cremation. Sedentary, urn cremation. Classic, urn cremation, inhumation (Pueblo). Recent, cremation. Modern, inhumation.

Houses

Colonial, rectangular, shallow pit, vestibule entrance on side. In some cases floor raised above bottom of pit on stone posts. Walls of poles, brush, and mud plaster. Each dwelling a unit in the village.[39] Sedentary: rectangular pit houses, rectangular surface houses with a framework of poles, covered with grass and daubed with mud. Villages enclosed in a compound wall.[40] Classic: pit houses, one story surface houses of poles, grass and mud; multi-storied communal buildings often referred to as temples, fortresses, or clan castles (Casa Grande) but which were essentially pueblos. The compound wall continued in use. Recent: pole, brush and clay houses and in some sections a combination of compound and pueblos. Modern: pole, brush and clay dwellings.

[38] Information supplied by Gladwin.
[39] Haury, 1932.
[40] Woodward, 1931.

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POTTERY

Colonial: red on buff and plain brown wares. The decorated vessels have a buff base color with designs in red. Vessels are bowls, jars, plates, effigies. Distinguishing features for the Colonial period are a typical bowl shape, like an inverted bell with a wide flaring rim, and the nature of the decorations. Most designs were formed by the repeated use of small elements bordered or fringed on one or both sides by sets of short, oblique, parallel lines. Common elements are figures resembling a simple or crude swastika, the letter z, the letter x, number 3; naturalistic symbols such as birds, mammal, reptile, and human forms; solid figures, triangles, rectangles, trapezoids, circles (all of the latter often enclosing a small element); interlocking scrolls applied in narrow bands. The kind of pottery which identifies the Colonial period has been named Santa Cruz red on buff. The brown vessels are called Gila plain ware.[41]

Sedentary: painted pottery a clear buff base color with designs in red, a plain red ware with black interior, a terra cotta red with black interior. No decorated bowls identified with this period, style changed to bowls of terra cotta red with black interior. Painted vessels mainly jars and dippers. Jars large with sharply returned and flattened rim. The area of greatest diameter well below the center of the jar producing a sharp angle, the Gila shoulder, and giving the effect of a flat-bottomed, although actually rounded, vessel. Designs composed of panels, the chief elements of which are herring-bone patterns, stepped lines, hachures, frets bordered with fringes of short, narrow lines. The negative type of design is common and the patterns were tied together by interlocking scrolls. The name of the painted ware which identifies the period is Sacaton red on buff. The red with black interior is called Santan red ware, and the terra cotta red with black interior is Gila red ware. The latter is believed to be a developed form of the Gila plain ware of the Colonial period. Colonial sherds are also found at all Sedentary sites.[42]

Classic: red on buff, terra cotta red, and the introduced polychrome. The painted red on buff has a fainter base color than in preceding stages, often faded to a faint brown. New technique in the decoration of bowls. Interior colored a dull gray-blue, by burning, and ornamented by a band of red decoration, usually a running fret. Outside decoration, bold designs with cross hatching common. The typical feature of the Classic is the jars. Body shape is globular, but the Gila shoulder retained in modified form. Necks distinct from previous stages in that they were vertical. Negative patterns of frets commonly employed in decorations which closely resemble Sedentary designs. Vessel necks ornamented with square fret, panels of parallel or stepped lines, interlocking negative patterns. Main pottery of the period from the standpoint of the Hohokam seems to have been the terra cotta or Gila red ware. Vessels in this group include square and rounded bowls, jars, pitchers, ladles, effigies, canteens, and eccentric forms. Occasionally there was an exterior design in white, a thin zigzag line bordered by rows of dots. Apparently

[41] Gladwin, 1933; Haury, 1932.
[42] Gladwin, 1933.

synchronous with the advent of the polychrome wares there was a further development of the red on buff in which bowls and small wide-mouthed jars were smoke blackened on the interior, and both the interior and exterior surfaces of the vessels were given a high polish. In the polychrome group all visible surfaces have a clear, well polished red slip upon which bands and fields of white slip were applied as a background for the designs which were painted in black, or occasionally black and red.[43] This is the ware which is correlated with the Pueblo peoples, and it was on pottery of this type that earlier conclusions that the Gila remains were a variation of the Pueblo were based. The typical red on buff jar forms which identify the period are called Casa Grande red on buff; the terra cotta red is Gila red ware.[44] The dull gray-blue bowls are known as Tucson red on buff.[45] The polychrome group has a variety of names, Salado, Pinto, Tonto, Gila, depending upon the source and local characteristics.[46]

Recent: large percentage of plain ware. It is generally a red, porous ware of brick-like consistency with heavy firing smudges. It resembles the plain ware of the modern Pima and Papago.[47]

Modern: the pottery is modern Pima, a highly polished red with designs in black, and the Papago, bright red bowls highly polished both inside and out, and jars with a grayish or brownish buff base color and designs in a brownish red.

There are certain general features in the Hohokam which should be noted. In the Gila basin the Colonial progressed from east to west and north to south; the Sedentary was distributed over the entire area; the Classic centered around Casa Grande; the Recent occurs mainly in the north; the Historic only in the south; in some districts some stages are missing. There was no Classic in the west where the Sedentary developed into Modern. In the southern periphery, the Papagueria, there was no Sedentary. The great irrigation systems of the Gila-Salt River valleys attained their maximum development in the Classic. It is thought by the investigators in this province that the Hohokam cultural pattern flowed outward to effect peripheral areas where the people were in a less advanced stage of development, rather than that the Hohokam received its impetus from an exterior source.

As stated previously, the Hohokam periods correlate roughly with the Pueblo stages. This has been indicated by the finding of Pueblo potsherds in Hohokam sites or an association of potsherds in border line districts separating the two provinces. Pueblo I potsherds have been found in

[43] Kidder, 1924, 109–10.
[44] Gladwin, 1933.
[45] Gladwin, undated, p. 119, type 2.
[46] Gladwin, 1930b.
[47] Gladwin, 1930a, 178, type 2.

Colonial sites, Pueblo II-III in Sedentary, Pueblo III-IV in Classic. In southwestern New Mexico a series of sites, designated Mogollon by Gladwin, which differ from both the Hohokam and the Pueblo, yielded a few Basket Maker II sherds as well as some Colonial Hohokam. From this evidence it has been suggested that the Colonial existed through Basket Maker III, Pueblo I and II into early III. Since the site in question furnished a dendrochronological date of 900 and it is known that Pueblo I was in full flower in the north by 800, the cross finds are not as significant as they might be under other circumstances. Furthermore, no Hohokam sherds have thus far been found in any Basket Maker III sites. The Pueblo I material associated with Hohokam Colonial has been mainly of the western type, which present evidence indicates to be later than eastern Pueblo I. Under the circumstances it would seem precipitate to attempt any closer correlation than that of an approximate synchronization.

One of the interesting problems is that of the paddle and anvil pottery. The question naturally arises as to where this method was derived from and what relation it bears to other areas where a similar technique was used.[48] If the modern Pima are descendants of the Hohokam, their pottery making methods may possibly be considered as a heritage from their predecessors. The Pima pottery is paddle and anvil finished but it is built up by coiling, as is also the case in the southern California and Colorado River tribes. If the same was true for the Hohokam there was not as great a difference in Southwestern ceramics as the general statement of coiled versus paddle and anvil would indicate. Basically they are similar, the distinction being in the finishing processes.

COMMENTARY

The Pecos Classification has been enthusiastically praised on the one hand and ardently damned on the other. Its proponents have felt that it was the most outstanding advance in years, while those who have not subscribed to its tenets are convinced that it represents the ultimate in asininity. Both the pros and the cons have shown a propensity to fall into the same error, namely that of thinking that the classification was final. Such was not the idea of the conference. Consensus of opinion was that whenever clear-cut proof warranted a change there should be no hesitancy about making the necessary modifications. An example of this is shown in the case of the Hohokam. Criticism has been forthcoming on a number of counts. In some cases the exceptions have been well taken; in others they show merely a lack of understanding, a failure to read carefully or even

[48] Gifford, 1928.

attempt, it would seem, to discern the intention of the classification. Among the more intelligent criticisms the outstanding are: that the use of a numerical system has too definitely fixed a time element for the whole province; that it implies a cultural homogeniety in all districts; that too great reliance is placed upon pottery; that there is no need for Basket Maker I; that the various terms are not sufficiently defined; that the assumption that all elements in the complex, except agriculture and the idea of pottery making, were independent local developments is open to question.

Not in the sense of a defense of the Pecos Classification, but to make clear how those most concerned in its formation interpret it may help in understanding its ramifications. In the first place the Basket Maker-Pueblo remains are thought to be representative of a single cultural pattern. The various periods are not regarded as distinct cultures, rather as stylistic or developmental sections of that pattern. It is not thought that the growth followed a smooth and orderly progression. On the contrary, that the advances were intermittent with periods of quiescence during which there was little change. It is the material from the intervals when conditions were static which furnishes the picture for each typical horizon. The lines of demarcation between stages are often vague and there is an overlap of characteristics which may tend to be confusing, although such occurrences generally can be explained.

While the progression of stages infers a certain degree of contemporaneity betweeen sites of the same horizon, it does not necessarily mean that they will fall within identical chronological dates. There may have been, no doubt frequently was, a difference in the precise years in which similar objects were in vogue in different districts. For this reason a simple numerical classification, i.e., dates, is not feasible at the present time. Also, it should not be expected that in every district each group passed through all of the stages. In some sections Pueblo I survived until it was supplanted by Pueblo III. In other parts of the province Basket Maker III continued until it was replaced by Pueblo II. This explains statements in some recent publications to the effect that there was no Pueblo I and in others that there was no Pueblo II. Similar conditions were pointed out for the Hohokam where certain stages are missing in some districts.

Many times the difficulties encountered in determining the horizon of a site are to be attributed not so much to shortcomings of the Pecos Classification as to the failure of the investigator to properly identify his material. The latter can partially be blamed on the classification on the grounds that the definitions are not sufficiently detailed. The excavator on the other hand

may be at fault for not familiarizing himself with the literature on the subject. One reason why the summarized tabulation of the sequence and nomenclature was not more specific was due to the fact that those attending the first conference recognized immediately the characteristics of the stage to which each name applied. Realization that newcomers in the field and those with only a general interest in the subject would not have the knowledge necessary to an understanding of the classification led to an amplification in a number of articles and reports written subsequent to the first and second conferences. These publications cited examples of ruins illustrative of the several stages with names of the authors and the monographs which described the artifacts found there. The papers do not as a rule use the Pecos terminology since they antedate its adoption, but in every instance the correlation is indicated in the article supplying the reference.

The complaint that the use of a numerical system too definitely fixes a chronology has justification, but regardless of what form the designations may take the existence of a certain temporal aspect can not be ignored, because there was a sequence in the development of components of the cultural pattern. That the classification implies a cultural homogeneity in all districts is true, and there is no reason why it should not, because in a broad sense there was a general similarity. In any pattern resulting from home industry there unquestionably will be local variations and regional differences. The age of mass production with clothing, implements, household utensils, ready-to-erect dwellings, all fabricated along standardized lines, had not yet been inflicted upon the country. As a consequence allowances must be made for deviations from the general pattern. Regional variations can be emphasized by using the horizon name in conjunction with that of the district, as Basket Maker III-Chaco Canyon. Pronounced complex differences within small restricted districts may be indicated by the addition of the site name in designations, as Pueblo I-La Plata-Red Horse Gulch. In this connection it may be said, that while horizon fluctuations and period differences in a single region are important, it is just as essential to point out the variations in the same level over the whole province.

The most persistent criticism of the Pecos Classification is that concerning its great dependence upon pottery. Actually much of the censure directed toward that aspect of the problem may be attributed to ramifications for which the classification is only partly to blame. The emphasis placed upon pottery in both the Pecos and Globe sequences, as well as in the discussions at the various conferences, focused attention upon that particular element in the cultural pattern. The result has been that many have made

a means the end. An opinion frequently heard of late is that Southwestern archaeology seems to have become the Elysian fields of the ceramists from which any and all who evince the slightest concern about anything but potsherds must be purged. This is unfortunate, but it is not without some foundation. Much valuable effort is being expended in obtaining information which is of import only insofar as it contributes to the story as a whole, and there seems to be an increasing tendency to disregard the latter part of the problem. A minute study of all the shades of variation and fractional degrees of difference in the pottery of a single site or restricted district constitutes a worthwhile contribution in the field of ceramics. Its full archaeological significance is lost, though, unless its relation to other components in the complex is made clear. The data should be presented in such a way that those who see the Southwest as something more than a mass of potsherds can fit the material into its proper niche in the major structure. While such a statement should not be necessary, it must be pointed out that the work in general calls for wholehearted coöperation and the presentation of all the information. The publicly expressed attitude prevailing in some quarters that "we don't give a whoop about outsiders, whether professional anthropologists or laymen" is inexcusable. "Rugged individualism" has no place in Southwestern archaeology.

Inconsistencies in the results obtained by determining cultural levels from the kinds of pottery found at sites are frequently pointed out as an illustration of the shortcomings of both the Pecos and Globe classifications. Such discrepancies are often solely due to the manner in which the material was interpreted. Under the Pecos sequence, where culinary vessel sherds occur, identification should not be attempted unless sizeable rim or neck fragments are present. It is difficult to determine whether a sherd from the bottom of a smooth surfaced pot is Basket Maker III, Pueblo I, or II. Yet if it came from the neck or rim portion of the jar there would be no dispute. In a number of cases Basket Maker III has been reported on the strength of potsherds which, when accompanying elements are taken into account, should be identified as Pueblo II. Some village remains have been classified as Basket Maker III when there was a large showing of the banded neck Pueblo I type of vessel. Similar conditions prevail in the painted ware groups. Each cultural level has a number of characteristics in pottery and these should be well represented if the identification is to be made upon ceramics alone. Too often reliance is placed upon a single pottery type. Considering the likelihood of survivals this is a tenuous thread upon which to hang conclusions.

One factor which has complicated the use of pottery types in determin-

ing horizons is the divergent methods of making classifications now in use. Some are based on paste quality, others upon design; some make color the criterion, others note only the surface. In many cases the form or shape is ignored because the studies are confined to potsherds. One student names a ware on the strength of his paste analysis, another gives it a different title from its style of design, then a third with surface finish as the criterion adds still another designation. When this condition is multiplied many times over it is no wonder that the ensuing hodge-podge brings dismay. In making a classification for pottery, all of its characteristics should be considered, but hard and fast rules of systematization can not be laid down for its description. As manufactured in the Southwest, it was too plastic an element to conform to rigid specifications. Each household was its own producer of ceramics and while the finished product conformed in general to the prevailing style there were distinct dissimilarities in minor details. This was not only true of the output from different families but of the products of each individual potter as well. As a consequence deviations from a specific pattern will be the rule rather than the exception. It is possible, however, to draw up standards of description which will adequately identify a particular vessel or group of vessels. Any delineation should be based upon the fundamental features of paste, surface finish, decoration, and form. From the standpoint of paste analysis, both as to content and to hardness, the only reliable conclusions are those based on laboratory tests such as have been developed by Miss Shephard at the Laboratory of Anthropology at Santa Fé. Classifications made with consideration of the four factors named above avoid many subsequent difficulties and reduce the total number of groups in the tabulation. Some of the schemes recently proposed would, if followed to their logical conclusions, require a separate class for every pot made in the area. One feature which should be improved is that many of the present classifications not only fail to indicate relationships and similarities between forms which unquestionably are minor variations of a general basic group, but they imply that the differences are equal to those existing between totally distinct types.

As one who has made considerable use of both potsherds and pottery in Southwestern studies, the writer does not by any means deny or belittle their value. He is aware, however, that too great reliance can be placed upon the evidence which they furnish unless it is substantiated by that from other elements. There is no question but what pottery is more sensitive to change than anything else in the complex. Yet in itself it is not sufficient to delineate the whole history of Southwestern development any more than an outline of the changes in styles of china and crockery can

depict the entire course of events in Europe from the time of the Battle of Hastings to the fall of the German Empire.

The criticism of the assumption that the whole Basket Maker-Pueblo pattern is indigenous to the Southwest, except for agriculture and the idea of pottery making, focuses attention upon some of the most pressing problems of the entire study. At the time of the first Pecos conference general opinion was that the pattern had originated in the San Juan area and spread to other regions. There is no question but what much that is typically Puebloan did reach its maximum development in the great San Juan centers and diffuse from them. On the other hand it still remains to be proved that the basic forms of those elements were not introduced from the outside. Closely allied with this problem is that of the Hohokam and its apparent appearance as a full-blown pattern in the desert domain. The belief expressed by those working in that province, that many basic Pueblo traits were transmitted to them from the Hohokam and that the former, with "barbaric vigor," improved upon and carried them to perfection, is open to considerable question. This is particularly so since many of the features are basically quite different.

One important factor in the problem of indigenous development for the uplands pattern lies in the results of dendrochronological studies. Whereas thousands of years had been postulated for the unfolding of the complex, actual dates now show it to have been an extremely short and rapid florescence. Pueblo I dates from approximately 800 to 900 A.D.; Pueblo II, 875 to 950, longer in the peripheral districts. It is possible that the true significance is that the tendency to regard cultures as the result of a slow and laborious process of advancement has been erroneous, and thinking should be modified to the extent that it can comprehend a swift culmination not only for individual elements but for a whole complex. Victor Mindeleff asserted over forty years ago that Pueblo architecture was the result of a comparatively rapid development and that once attained it persisted over a long period of time. Tree-ring data certainly prove his contention. Dendrochronological dates are not now available for the Hohokam and the general belief is that the pattern represents a long interval of development. Since the Pueblo province has been demonstrated to be of recent date, those most concerned with the Hohokam judge that it must be older than Basket Maker-Pueblo. Considering the evidence from the latter, it would seem that in so doing they were falling into the same error with respect to speed of culture growth and that their estimates for the age of the Hohokam may need to be revised.

Criticism of the Globe Classification and the general presentation of the

Hohokam pattern has not been as pronounced as that against the Basket Maker-Pueblo. Of course there are some who insist that it is all "hokum," but in view of the available evidence, that is beside the point. Lack of censure may be attributed to a number of factors. When the sequence was formulated the conferees profited by some of the mistakes made at the Pecos sessions and thus avoided subsequent controversies over minor items. A good example of the benefits accruing from the Pecos discussions and subsequent fault finding is to be observed in the Hohokam terminology. It uses names without numbers, although a certain progression is recognized and reports frequently use figures for convenience in referring to the stages. The major complaint against too marked a dependence upon ceramics and too detailed studies of potsherds *per se* apply to the Hohokam in the same degree as they do to the Basket Maker-Pueblo. As a matter of fact the Hohokam structure was largely erected from potsherd surveys and surface material, and depends to an even greater extent on pottery for period determination, than is the case in the northern province. Excavations made at several sites have tended to substantiate the distinctions made from ceramic characteristics, but much more intensive work with the spade is necessary before evidence now available can be considered conclusive.

There have been numerous proposals in recent months for another conference of workers for the purpose of clearing up present difficulties with nomenclature, classifications, potsherd studies, regional variations, and methods of procedure. Many favor a complete repudiation of both the Pecos and Globe sequences and the starting from scratch with an entirely new terminology. Others are not as drastic and suggest that with a few minor changes both would prove reasonably satisfactory to most of those working in the field. There are many items more pressing than the question of the nomenclature of the major provinces and the developmental stages in the two patterns. The writer thinks that the present classifications are satisfactory as far as they go and sees no particular need for change at the present time; amplification and expansion are essential but complete revision is not the paramount issue.

The nomenclature for the elements in the complex—house forms, implements, pottery types, pottery forms, decorations, areas, etc.—is still in a muddled condition. The naming of pottery types has proved satisfactory in a majority of cases. The plan is to employ binomial terms: a geographic name followed by a technically descriptive word, as Chaco Black on White, Pecos Glaze. The geographic name may be that of the site where the type was first encountered or it may be indicative of the locality of highest

development. Sometimes this is one and the same, although they are frequently different. This explains the numerous examples of discrepancy between the type name and the name of the type site. This situation could be alleviated if the workers were not in such a rush to christen every new potsherd which they find. Definite designations could be withheld, a working title would suffice, until the form was established as a type, the limits of distribution determined, the center of development noted, and the name then be given. A few investigators have followed this plan with good results. In this connection it might be advisable for the ceramists to circularize brief descriptions of new forms, requesting from other specialists such information as they might have on similar specimens and asking if they had been named. This would avoid complications such as now exist where the same type bears several names, each man finding it bestowing a different one. Names for various shapes of pottery do not follow any special plan, except in the Hohokam where a glossary adopted at the Globe conference is employed. Hence there is considerable confusion in the use of such designations as are current. Some workers rely on Spanish words, others use the English, but the names appear indiscriminately in the descriptions of a great variety of vessels. The Hohokam glossary would not function without some modification in the case of the uplands pattern, and thus far no consideration has been given to the problem of making adaptations from it. There likewise is need of a glossary of terms for the various design elements, as well as for styles and types of decoration, since these factors play an important part in regional and horizon studies.

When other objects in the complex are considered, it is observed that there are neither classifications nor names for types. There is no agreement on what constitutes a pit house; the term slab house is carelessly employed; what a pueblo is has not been clearly defined; and architectural features in general are indifferently designated and described. There are no accepted names for the different kinds of stone and bone implements. The area designations are satisfactory in a geographical sense but fail from the viewpoint of indicating phases in the cultural pattern. Much confusion is caused and erroneous conceptions are presented by the terms San Juan culture, Little Colorado culture, etc., because typical features of each are not confined to those areas nor does the material in each constitute a unit. The Chaco phase of the San Juan is considered characteristic of the geographical subdivision, when as a matter of fact Chaco type remains are numerous in the upper Little Colorado and extend over into the Rio Grande. The Kayenta ruins are regarded as San Juan, although they are distinct from Chaco, but many typical Kayenta elements are found in the

Little Colorado. The Little Colorado, on the other hand, contains a heterogeneous lot of remains of Chaco, Kayenta, and Upper Gila derivation as well as characteristically local features. For this reason it would seem better to restrict the use of such geographical terms entirely to an indication of the topographical district, while the archaeological features are denoted by the more specific Chaco phase, Pecos phase. In other words make the classification one of phases rather than of drainage systems. Definite locations could be identified by an additional term such as the Bonito aspect of the Chaco phase.

One of the greatest needs at the present time is a series of comparative studies of bone tools, axes, spear and arrowheads, knife blades, scrapers, milling stones, and related objects. These studies should not only include classifications, but also indicate associations between the various types and other elements in the complex. Furthermore, distribution maps showing the ranges of the various types are essential. This group of artifacts should have careful and thorough treatment of the kind hitherto accorded mainly to ceramics and in some degree to basketry. Except for a very few notable examples, practically no attempt has been made to obtain information from these elements in the material culture.

Questions frequently asked which cannot be answered as yet concern the brachycephalic groups which appeared in the uplands province and became the Pueblo peoples. Where they came from and what lines their penetration into the area followed still have to be determined. Gladwin has attributed the "round-head" invasion to Caddoan peoples because of resemblances between their skeletal and archaeological material and similar remains from certain sites in the southern part of the Pueblo province. Because of considerable disagreement as to what Caddoan is archaeologically and the supposedly late arrival of the Caddo in the Southwest, this suggestion will no doubt provoke much discussion. Perhaps the skeletal similarities should more properly be attributed to a development of both Pueblo and southern Plains peoples out of a basic strain of brachycephals which drifted south along the cordillera to diffuse in several directions. Nevertheless their origin is one of the things which needs to be determined.

The question of the two types of pit houses, the Hohokam and the Basket Maker-Pueblo, calls for consideration. Kidder and Guernsey advanced the theory some years ago that the first Basket Maker houses were an outgrowth from the slab-lined storage bins of the Basket Makers. In its earliest known form, however, the house is so specialized and bears such a striking resemblance to some of the structures in northeastern Asia

that the similarities would hardly seem to be the result of mere coincidence. On the other hand if Kidder and Guernsey had postulated the above-ground structures as being derived from the granaries they would have been correct. The writer found this to be the case in southern Colorado[49] and at a site near Allantown, Arizona, and workers from the Flagstaff, Arizona, museum observed such a transition in that district.[50] The affiliations of the Hohokam houses are not clear. Superficially they do not give the impression of being derived from the Basket Maker-Pueblo form, nor does the latter suggest that it was influenced by the Hohokam. Both have certain features in common, namely pole and plaster superstructures, a side entrance passage (present only in Basket Maker III but surviving as a ventilator in later horizons), and the floor level below that of the surrounding terrain. Some of the Basket Maker-Pueblo pits were rectangular with rounded corners, although they more closely approximate a square than do the Hohokam. In addition the interior features of the two are quite different. Both may have been derived from some basic form and have developed along divergent lines before they appeared in the Southwest. Inasmuch as certain elements of the Hohokam are considered an indication that it penetrated into the desert domain from the east, it may be that the house form is in some way related to the rectangular earth lodges of southwestern Arkansas, Kansas, and Nebraska.[51] That the latter, Kansas-Nebraska, are particularly suggestive of something basic in the matter of affinities is indicated by the fact that the pottery associated with them seems to have been made in the paddle and anvil technique, one of the Hohokam traits. Harrington's pottery was of the coiled variety. On the other hand, until the possibilities of showing local developments have been exhausted, it would appear somewhat illogical to go so far afield for evidence.

The outlying districts present a number of problems. Among them is the question as to whether or not the Northern Periphery should be considered as a separate cultural province related to Basket Maker-Pueblo rather than an essential part of it. Also, should the remains in northwestern Arizona and southern Nevada be grouped into a division to be known as the Western Periphery? In the east the limits of the Basket Maker-Pueblo should be traced. Some work is being done on this problem but it deserves more consideration. Then there are the questions of the so-called Basket Maker in the Eastern Periphery and the relationships between the Plains

[49] Roberts, 1930, 63.

[50] Colton and Hargrave, 1933, 73.

[51] Harrington, 1920, pl. 6, pp. 49, 79; Sterns, 1914, 136.

type sites and the pueblo forms. Should the Big Bend cave materials be considered as representing a peripheral off-shoot of the Basket Makers or a separate pattern with some Basket Maker similarities? The writer is inclined to adopt the latter view inasmuch as the main criteria of relationship are the atlatl and curved club. These implements were probably so basic and widespread at one time that *per se* they have no marked significance in the problem of affinities and pattern identification. Unless other characteristic elements are present, the complex should not be considered Basket Maker merely because it includes the club and atlatl. Furthermore, the latter do not necessarily imply any great antiquity when the facts of their late survival in certain districts are recalled.

One thing frequently mentioned in discussions of Southwestern problems, although no one ever seems to do very much about it, is that of carrying the investigations across the international border. The Southwest must be considered as only a portion of a large culture area which likewise includes northern Mexico. The true explanation of many Basket Maker-Pueblo features, unquestionably Hohokam traits as well, will only be obtained after much work has been done to the south of their region. Numerous sites must be excavated in the same careful technique employed in the north in the last few years. Rapid surveys and sporadic sampling have produced some information but, as yet, nothing definite enough to be relied upon. Present evidence in the material culture indicates that after Basket Maker II there was very little, if any, contact between Mexico and the Basket Maker-Pueblo province. In Pueblo III some trade objects appeared which undoubtedly are of Mexican origin, but there was no marked effect on the pattern proper. Whether this was due to the presence of the Hohokam and its serving as a buffer or to some other reason constitutes one aspect of the problem.

The Hohokam presents the question of its origin. There is also the matter of relationship between this group and the so-called Yuman peoples of southern California where certain elements indicate a definite basic tie-up. Furthermore, it has been suggested that the Hohokam, southern California, Sonora, and possibly lower California, should be grouped into one single province comparable to that of the Pueblo area. This consideration includes more than archaeology and calls for close coöperation with the ethnologists. Insofar as the Hohokam itself is concerned, the greatest need at the present time is additional work in the remains of that pattern. When more evidence is amassed various lacunæ may disappear and troublesome features become simple. What intrigues many of the workers is the correlation, both chronologically and culturally, between the Ho-

hokam and the Basket Maker-Pueblo. Suggestions that the Basket Makers received their cultural stimulus from the Hohokam need considerably more support in the form of tangible evidence. It is true that the elements of agriculture and pottery must have been transmitted from the south through some intermediary, but if they came through the Hohokam it would seem that they would more closely parallel that pattern. Certainly the pottery does not and the agricultural methods differed. Until more is known about the Hohokam, however, and the evidence of contacts more convincingly established there should be no rash attempts to compare its stages with those of Basket Maker-Pueblo.

There are many more problems, many ramifications, and numerous views on the Southwest which cannot be included in the present article. Many of these have been pointed out by Doctor Kidder in the Pecos reports, by Doctor Kroeber,[52] by the Medallion Papers, the publications of the Flagstaff museum, and other institutions. An indication of the task confronting the archaeologist is indicated by the examples which have been mentioned and it becomes increasingly clear that the field is by no means worked out. The efforts of the future will of necessity be more detailed than those of the past. When such is the case there is danger that students will lose sight of the significance of their work which, as others have pointed out before, should be that of preparing the basis for a solution of a problem in cultural evolution.

As a result of recent progress there has been a tendency to overlook the work of earlier investigators. This is a mistake, as many important facts are recorded in the pages of their reports. A better knowledge of the literature is unquestionably required by numerous present day workers. One example of a lack of background is shown by occurrences in the last few years. On two different occasions there was a great ballyhoo and splashing of headlines in the press over the discovery of large and vitally important ruins or groups of ruins; a third case was explained in a recent issue of the AMERICAN ANTHROPOLOGIST. One of the groups of ruins so heralded was presented with ground plans and a fairly complete description in 1896. The second was reported in 1874, was discussed at a scientific meeting in 1912; an article on investigations in the district was published in 1920; mention of it was made again in 1930; then in 1931 it was "discovered." In each of these cases professional archaeologists were involved. There is need also for better ethnological knowledge on the part of archaeologists working in the area, and early Spanish journals should not be forgotten; there is much of value to be gained from them.

[52] Kroeber, 1928.

On the whole it may be said that investigations in the Southwest have been producing good results. Despite the criticism directed towards them, both the Pecos and Globe classifications have functioned reasonably well when used with discretion and when proper allowances have been made for local variations. They have been helpful in keeping a broader view of the subject constantly before the investigator. Moreover, they have assisted students in other branches of anthropology and interested laymen in discerning what the archaeologists are trying to do and what their progress has been.

In conclusion the writer may offer one suggestion with respect to what appears to be one of the "burning issues," the Pecos Classification. Since the chronological implications of the sequence seem to be the cause of so much dissatisfaction and difficulty, a slight revision of the terminology may be proposed. Because the terms early and late, as well as numerals, inherently imply chronology, they may be omitted. With these factors in mind the following nomenclature is offered for consideration.

Basket Maker: to designate the stage at present indicated by the titles Basket Maker II or Classic Basket Maker. This name was given as an optional term in the original Pecos list. (Since there is no evidence for an antecedent stage, a designation for such a stage is omitted here.)

Modified Basket Maker: this would replace Basket Maker III, Late Basket Maker, or Post Basket Maker. The designation would have the merit of indicating that the level was basically Basket Maker, although somewhat changed in form.

Developmental Pueblo: this term was used by Morris several years prior to the first Pecos Conference and is now proposed again to supplant both Pueblo I and Pueblo II, incorporating them under the one heading. The complexities caused by the absence of one or the other in some sections and the difficulty of horizon determinations in others would thus be eliminated. It would indicate that the complex was in the evolutionary stages leading up to the maximum development.

Great Pueblo: an alternative title for Pueblo III in the original nomenclature, may be retained to designate the era which was truly the classic period of the Pueblos.

Regressive Pueblo: replacing the Pueblo IV, this name would denote the period in which there was a general recession from the preceding cultural peak.

Historic Pueblo: another choice proffered by the original tabulation, instead of Pueblo V.

It is not thought that these names would solve the nomenclature problem in its entirety, but if they are employed to indicate the cultural level of each site, while the actual chronological position is determined by dendrochronology, much present confusion can be avoided. Also, certain psychological resistance to a more general acceptance of the classification

might be lessened. It should be emphasized that these designations apply to the complex and not to a single element or series of years. The criteria outlined in the Basket Maker-Pueblo discussion would hold for this classification. Even in the case of the original Pecos nomenclature the several horizons should only be considered as indicating the cultural level, the chronology being established by tree-ring dates as suggested above.

Just after the completion of this article a paper proposing a method for the designation of cultures and their variations was published by the Gladwins.[53] It suggests a system of roots, stems, branches, and phases. Characteristic features of the phases are described in uniform terms which avoid such comparatives and prefixes as early, late, pre-, post-, etc. The Pecos and Globe nomenclatures for the main sequences, as well as other familiar terms, are retained. The authors state that the purpose of their plan is to furnish the specialist with a means for making minor distinctions in the building up of sequences and at the same time supply those not concerned with the minutiæ of classifications with broader terms. A series of charts illustrating the plan in use are presented. These include names of present linguistic groups in an effort to fit them into the archaeological pattern, which is a hazardous procedure in the present state of our knowledge, but one which furnishes food for thought. The scheme has considerable merit in its wider aspects and is worthy of careful consideration. In some respects it offers solutions to classification problems discussed in preceding pages; in others it adds new ones. The writer does not agree with the interpretation placed on certain features in the Southwest nor some of the groupings in the charts but that is a matter of viewpoint. The plan does provide a systematic method of classification and a means for presenting the archaeological material in a diagrammatic way.

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TRIBAL INITIATION OF BOYS IN ANGOLA

By WILFRID D. HAMBLY

AN ACCOUNT of initiation rites at Kuchi, Ngongo near Ngalangi, and at Cangamba, has recently been published.[1] At the two first places mentioned a mixture of Ovimbundu and Vachokue tribes occurs. But Cangamba (20°E, 13°S) is a typical center of Vachokue culture, though some of the Babunda and the Valuchazi tribesmen are present.

A comparative study of local rites can now be made with the help of data from the published articles of independent observers: H. Baumann,[2] F. and W. Jaspert,[3] A. Schachtzabel,[4] C. P. Holdredge,[5] and P. A. Delille,[6] whose reports will be considered *inter se* and with my own notes. Personal observations made at Cangamba are particularly useful for comparative study, since the notes were made several hundred miles from initiation centers described by Baumann, Delille, and Holdredge.

COMPARATIVE STUDY

The rites reported in *The Ovimbundu of Angola* are in harmony with those observed in many Bantu Negro tribes, and they are definitely part of an aggregation of initiation customs described by De Jonghe[7] and L. Frobenius,[8] while all the ceremonies illustrate the principles laid down in A. van Gennep's analysis of puberty rites.[9]

Despite local difference of procedure at Angolan centers, the essentials of the rites are the same everywhere. We have to note the basic distinction between the circumcised and the uncircumcised, seclusion, harsh treatment, instruction in dancing and tribal customs, fabrication of masks and costumes, also rigorous exclusion of women and the uninitiated. Yet to this absolute isolation of novices H. Baumann records some exceptions.[10]

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[1] The Ovimbundu of Angola (Anthropological Series, Field Museum of Natural History, Vol. 21, No. 2, 1934), pp. 226–33, Plates LXXVII–LXXXIII.

[2] Die Mannbarkeitsfeiern bei den Tšokwe (Baessler-Archiv, Vol. 15, No. 1, 1932).

[3] Die Völkstämme Mittel-Angolas (Stadischen Volker-Museum, Frankfurt am Main, 1930), p. 140, Plates 9, 10.

[4] Angola (Berlin, 1926), pp. 132–34, Plates 8, 13, 24, 48.

[5] Circumcision Rites Among the BaJok (American Anthropologist, Vol. 29: 661–69 1927).

[6] Besnijdenis bij de Aluunda's en Aluena's in de Streek ten Zuiden van Belgisch Kongo (Anthropos, Vol. 25: 851–58, 1930).

[7] Les sociétés secrètes au Bas-Congo (Brussels, 1907).

[8] Masken und Geheimbünde Afrikas (Halle, 1898).

[9] Les rites de passage (Paris, 1909).

[10] *Op. cit.*, p. 2.

The idea of death and rebirth is emphasized, and there is a change of name, while a ceremonial introduction to village life at the conclusion of the rites is important. Boys circumcised at the same time form an age grade whose nature and functions are inadequately known. The phallic nature of the ceremony is stressed. Barkcloth is still used for masks at places where trade cloth is now in general use.

Such are the general points of comparison of initiation ceremonies, but a more detailed examination of the evidence is instructive.

Information given to Schachtzabel (pp. 132–34) included the important point that novices who reappear in their village at the conclusion of the rites are returned spirits of the dead. This is one of the most constant concepts of all the rites. On his Plate XXIV showing masks at Kasindi, Schachtzabel portrays seven boys in fibre costumes, white fibre collars and skirts; also masks of Roman helmet type. These costumes are of the Kuchi pattern.

Schachtzabel's Plate XLVIII pictures high, conical, spirally-formed headdresses which he saw at Savitenga (17°-50′E, 14°-50′S). This mask is of exceptional interest because of its wide distribution in eastern Angola. The boy on the right in my Plate LXXIX, Figure 1 (Cangamba) is wearing such a mask, and the headdress is again shown in Jaspert's Plate IX, Figures 2 and 3; also in Baumann's Figure 24. H. Baumann states that he regards this high conical mask as the oldest form in use, and he notes that the design of the mask is applied to stools and other objects.

A unique mask is pictured by Schachtzabel (plate VIII). This was worn by a novice at Katoko (17° E, 15° S). The wings of the mask extend for several feet on each side of the wearer's head, though there is no elevation of the mask above the top of the head, and the general form of this headdress is that of a large boomerang worn transversely. I believe that no other example of this headdress has been reported.

Turning now from mixed central tribes—Vangangella, Vanyemba, and Ovimbundu (with some Vachokue influence)—we consider the Vachokue proper, who have as one of their centres Cangamba in southeast Angola. Another important Vachokue locality is Saurimo in Lunda, and between Cangamba and Saurimo is Dilolo, just over the Belgian border (23° E, 10° S), a place for which Delille's description of initiation rites is available.

The photographs given by Delille show that Dilolo and Cangamba, though three hundred miles apart, have the same costumes and rites. The medicine-man wearing a fibre suit, a leather apron, a collar of stiff reeds, and a helmet of barkcloth (Delille, fig. 2), is exactly like the Uluchazi medicine-man who took part in the ceremony at Cangamba (Hambly,

plate LXXXI, fig. 2). Furthermore, Delille's Figure 6 shows boys who are wearing short fibre skirts, while they are confined in small wicker cages closely resembling those photographed at Cangamba (Hambly, plate LXXX, fig. 2). And Delille's Figure 10, depicting seven novices of various statures wearing fibre skirts, is exactly like the novices in my Plate LXXX, Figure 1, showing initiates within the enclosure at Cangamba.

F. and W. Jaspert's Plate IX, Figure i arrests attention since the oval mask ascribed to the Vachokue resembles a disused mask that I obtained from Dr Ennis of Elende, a centre of Ovimbundu culture near the coast. Jaspert's illustration shows the mark of a cross in a circle on the cheek of the mask, and this is a pattern often cicatrized on the cheeks of Ovimbundu women at the present day. I think that the occurrence of this mask among the Vachokue is an instance of the cultural exchange which has been taking place between eastern and western Angola.

The personal observations of C. P. Holdredge were made near Chiombe River in northeast Angola, and later the account was written by Kimball Young. Holdredge appears to be the only reporter who was a witness of the circumcision rite among the Vachokue. The enforced absence of women and the uncircumcised, the building of a stockade for segregation of the novices, the use of fibre skirts, and all other observances are in agreement with data from Cangamba five hundred miles to the south.

The use of green leaves in Vachokue ceremonies is a point deserving further mention. Holdredge saw the novices washed with water and green leaves, and he further states that men chewed leaves which they spat on to the backs and bellies of the initiates. The stilt walkers at Cangamba carried bunches of leaves, and at the same place a medicine-man was seen to use bunches of leaves for washing his patients on several occasions. Evidently this ceremonial use of leaves is frequent and important among the Vachokue.

The statement of Holdredge, that none of the initiation class could be released until all had perfected their lessons, further explains why ethnologists have received such different estimates of the length of time which novices spend in the enclosure.

Holdredge mentions change of name and a prohibition against use of the former name, which was that of the child who by initiation has become a man. My interpreter mentioned that among the Ovimbundu at Elende a boy or a girl makes a voluntary change of name about the time of puberty. He said "they take names they like better," and this present custom may be a survival of a practice followed during initiation rites that are now decadent or obsolete among the Ovimbundu.

When discussing the age of the boys at circumcision, Baumann places the lowest limit at six years and the upward limit at twenty years, and he states that the higher the social standing the earlier the age of circumcision. Baumann further explains that, owing to present economic conditions, boys leave the enclosure intermittently in order to follow their usual occupations, for work must be done and hut taxes have to be paid. These data help to explain the disparity of age among the novices who were photographed and the various statements respecting duration of the rites.

Baumann introduces the subject of the bull-roarer (fig. 13) called ndumba-mwela, "the lion's roar," in the Chokue language. Baumann's experience was similar to my own, for he made many inquiries before seeing this instrument in use. Only once was I able to observe a bull-roarer in use, and then as a toy in the hands of an Ocimbundu boy of Elende.

According to Baumann (p. 13) the rite of circumcision is a ceremonial death, therefore mothers of the novices are informed that their boys have died. This information should not be confused with my observation that parents are informed of the death of a boy, whose bored wooden platter is returned from camp as an intimation of the owner's death. This custom at Ngongo is not symbolic of a *ceremonial* death and rebirth as a man; on the contrary the act is an intimation of an *actual* death.

Baumann and Holdredge agree in mentioning a special speech for the novices. Probably this "beschnittenensprache" is an archaic dialect, but no observer has given precise information on the subject. The phallic element mentioned in the rites at Cangamba (Hambly, plate LXXIX, fig. 2) is stressed by Baumann (figs. 10, 30, showing a phallus of wood). Baumann's Figure 25, showing an oval mask fringed with white hair as a beard, is of exactly the same pattern as that worn by a boy at Cangamba.

The foregoing records of different observers, investigating independently at various centres and at different times, give a fairly complete and understandable picture of initiation rites in eastern and east-central Angola. The accounts agree well *inter se*, and they harmonize in ritual and belief with the fundamentals of initiation ceremonies in the west and southwest of the Belgian Congo, though local differences in ceremonial dress and procedure have to be recognized.

DECLINE OF CEREMONIES

Initiation rites have undoubtedly declined among the Ovimbundu, but it is improbable that they are defunct. Père R. P. Laagel of the Caconda Catholic Mission stated that he had visited a circumcision camp for boys at Caconda in 1928. He reported that boys who revealed the secrets of the camp were likely to be poisoned, and that harsh treatment prevailed.

Dr M. W. Ennis, who has lived for thirty years at Elende, thinks there has been a reinvasion of circumcision rites in that district within the past fifteen years. Ngonga, my Ocimbundu interpreter, said that the Ovimbundu were taking initiation rites from the Vangangella, a name which the Ovimbundu use to designate a number of tribes of east-central Angola. This is the region in which the rites were observed at Kuchi and Ngongo.

Probably the explanation is that the Ovimbundu, because of their long and intimate contact with Europeans, have almost lost the rites of initiation. But these ceremonies have been better preserved among the more secluded tribes of the east, especially the Vachokue. No doubt exists with regard to the virility of the rites in east and central Angola, and the probability is that initiation ceremonies are gradually penetrating the central region occupied by the Ovimbundu. Of the initiation of girls in Angola scarcely any information is available, and the rite is one of the most important subjects for future research.

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CENSUS DATA FROM TWO HOPI VILLAGES

By PEARL BEAGLEHOLE

IN THE course of field work at the Second Mesa Hopi villages (Arizona) in the summer of 1934 I took a census of Mishongnovi and Shipaulovi villages.[1] Analysis of the data appears to throw some light on such topics as population and the sex ratio, household composition, variation from the pattern of matrilocal residence, types of marriage and their stability, and clan development, in these two villages. Much of the data is not conclusive since the material was collected at the end of, and incidental to, other inquiries. Though some pertinent facts which I did not get are readily procurable, a return trip is not immediately in sight, and I offer what data I have. The material was obtained from one well informed Shipaulovi woman, Irene, a member of the Sun's-Forehead clan married to a Mishongnovi Pumpkin clansman. Though young, she is remarkably cognizant of, and sympathetic to, Hopi institutions.[2] The data are given in tables supplemented by such comments as seem necessary.

POPULATION

The population figures are shown in Table 1. I did not obtain the number of males and females by age groups, which would be impossible in any case for the older individuals. I have not used the government census material because this, I think, is of more than doubtful accuracy. The classification of minors and adults roughly distinguishes persons older than the marrying age (18 to 25) from those below it.

TABLE 1

	Male Adults	*Female Adults*	*Male Minors*	*Female Minors*	*Total Males*	*Total Females*	*Males per 100 Females*	*Total Population*
Shipaulovi	30	22	17	31	47	53	88	100
Mishongnovi	55	45	75	64	130	109	118	239
Both villages	85	67	92	95	177	162	108.3	339

It is clear from the table that, while there is a preponderance of males in the two villages taken together, in Shipaulovi alone females outnumber males. In the latter village, however, there are nearly twice as many female

[1] I have to thank Dr Ernest Beaglehole for much valuable criticism of the manuscript.

[2] Wherever it was possible to check on her statements with other Hopi or with my own knowledge of the Mishongnovi households, her accuracy was found to be unquestionable.

minors as there are male minors and about three-fourths as many female adults as male. In Mishongnovi there are about four-fifths as many female minors as there are male minors and approximately three-fourths as many female adults as male. There is, then, a large preponderance of adult males over adult females in each village. Although I have no figures on the death rate for each sex, I would guess that the death rate for females is higher than for males, due possibly to a relatively high maternal mortality.

HOUSEHOLD COMPOSITION

I have included in this census the few houses located on the ledge below each village. These houses have preserved village identity in terms of the two parent villages. Following Kroeber,[3] I define household as the house unit in which a number of people live around a single hearth. Table 2 shows the number and size of the household in each village.

TABLE 2

	Households	*Population*	*Average per Household*
Shipaulovi	16	100	6.25
Mishongnovi	35	239	6.83

The average number of persons per household is considerably above that given by Fewkes and Mindeleff-Stephen for the period just prior to 1900.[4] The figure of these investigators was 4.8 for Shipaulovi and 5.4 for Mishongnovi. The averages computed for 1934 are still well below Kroeber's 1915–16 figure of 7.56 for Zuñi.[5]

The wide variation in the numerical composition of households is shown in the following table.

TABLE 3

Persons per household	2	3	4	5	6	7	8	9	10	11
Number of households, Shipaulovi	1	1	1	3	2	3	3	1	1	—
Number of households, Mishongnovi	2	3	4	4	—	4	9	4	1	4

The range in Shipaulovi is from 2 to 10 persons per household; in Mishongnovi from 2 to 11. But the interesting point is that whereas out of the

[3] Zuñi Kin and Clan (Anthropological Papers, American Museum of Natural History, Vol. 18, Pt. 2, 1917), p. 124.

[4] Quoted by Kroeber, *op. cit.*, 123.

[5] *Ibid.*, 124.

total number of fifty-one households there are 12 containing from 2 to 4 persons each, at the other end of the scale there are 23 households containing from 8 to 11 persons each. While I have no specific data on the subject, the household is, in my judgment, a fairly stable unit, excepting only such changes necessitated by marriage and the relatively few occasions on which young people of both sexes and old men change their residence for reasons mainly personal and economic.

Along with the variation in numerical composition is extreme variation in the kinship of the members of the individual households. The data for the two villages are given in Table 4. In describing relationships in this table, I use the term mother for the oldest married woman in the household, or for the senior woman where there is no married couple. Thus mother (*M*) may, or may not, have children, and she may or may not be the senior woman of the household. Father (*F*) is mother's mate, whether or not he is the biological father of her children. Children (*Ch*) covers married or unmarried sons and daughters of the mother. *D* is daughter; *Sis*, sister; *Bro*, brother; *H*, husband. Columns 1 to 17 include all mother's relatives residing with her in accordance with the rule of a matrilocal society. Columns 18 to 24 give father's relatives residing in the household as well as blood and affinal relatives equally of mother and father whose residence is not in accordance with the matrilocal rule. A cross in the appropriate column indicates the presence in the household of one or more persons related to the mother according to the caption at the top of the column. It does not necessarily indicate the number of such persons in the particular household.

The table shows, first, that of the 16 households in Shipaulovi no two are composed of the same kinship group. The thirty-five households in Mishongnovi give 20 different combinations of kin, of which 5 are duplicated in Shipaulovi. Taken together, the fifty-one households give 31 distinct groupings of relatives.

The biological family of mother, father, and children, is the basic unit in forty of the fifty-one households. There are two households in Shipaulovi (3, 12) and four in Mishongnovi (14, 15, 31, 35) in which the married daughter and her family reside with her mother. One household (15) in Shipaulovi includes, among other relatives, two married sisters, their husbands and families, an arrangement apparently infrequent and, in this solitary case, to be terminated soon by the removal of one family to a house now under construction. There are in Mishongnovi two households (28, 29) in which the married son (with his foreign wife) resides with his mother, an arrangement possibly not without precedent in those cases of Hopi-

Navaho intermarriage in the last half century where the couple preferred to reside with the husband's people.

The tendency today is for the married daughter to remove to a separate household as soon as her family is enlarged by two or three children; the new house she occupies is either another house in the village belonging to her clan, or, more desirably a new one on the ledge below. In one case (Mishongnovi, 14) where a couple is residing with the wife's mother and father, the junior husband has been in almost constant conflict with his mother-in-law, mainly over the matter of his children's upbringing. In order to escape from his mother-in-law the husband is anxious to move his family elsewhere, preferably to a new house on the ledge. For economic reasons he is unable to do this. He might move to another house owned by his wife's clan, but either her clan (Butterfly) has no vacant house, or, just as likely, his mother-in-law does not wish her daughter to occupy it. He tried to resolve the difficulty by moving to a vacant house owned by his own clan, to no avail, however, since his mother-in-law promptly padlocked her own house and took up residence in her daughter's new dwelling. I know of no other instance of overt conflict between a woman and her son-in-law resident in one household, though I suspect that in one other case (Mishongnovi, 15), latent hostility would be quickly manifest if the son-in-law did not spend much of his time away from the reservation. Unlike these two sons-in-law, one aged about 45 with an eldest child of 8 years, and the other about 35 with an eldest child of 5 years, the remaining four sons-in-law resident with their wives' mothers are relatively young, still well in their twenties, with children not more than 2 years old. This means that older husbands with older children either solve or avoid actual or potential mother-in-law conflict situations by living in independent households. This is the situation today, and in terms of psychological reality there seems no reason to doubt that this solution would have been adopted in former times, given available houses.

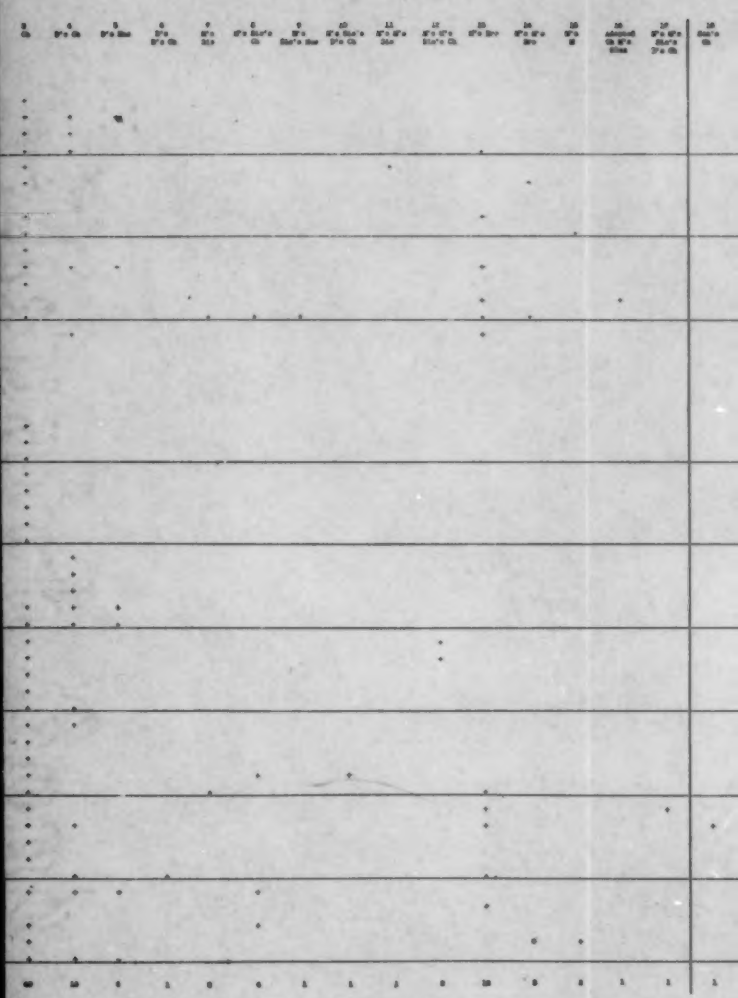
In each village there is one unmated widow at the head of a household. The remaining unmated woman at the head of a household is a divorcée.

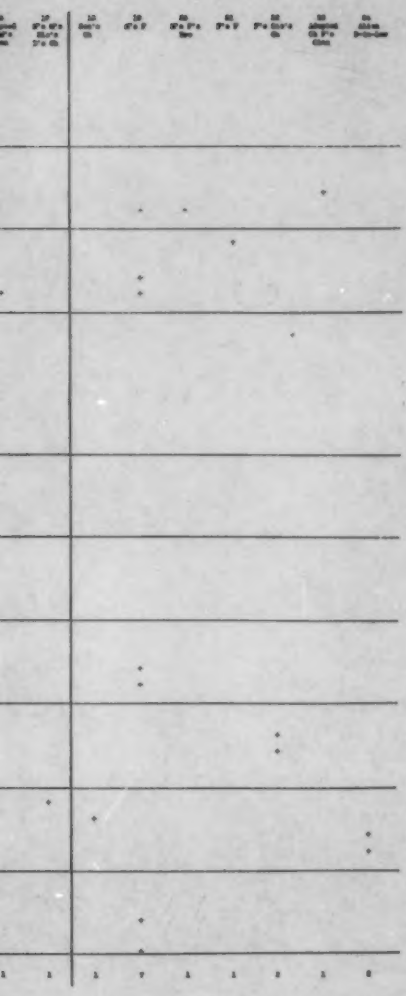
The following comments may help further to elucidate the table. Daughter's children, instanced in Column 4, where there is no daughter's husband indicated in the next column (5), are either the children of a deceased mother or of an unmarried, unmated mother. One household (16) in Shipaulovi embraces the children of the deceased daughter as do five households in Mishongnovi (11, 12, 13, 27, 30). In no case has the widowed father remained with the children in his wife's mother's house. But there is one case (Mishongnovi, 27) where, on the death of the mother, the

TABLE 4

Column No.	1	2	3	4	5	6	7	8	9	10	11	12	
Diagnostic traditions													
1.	•	•											
2.	•	•	•										
3.	•	•	•	•	•								
4.	•	•	•	•									
5.	•	•	•	•									
6.	•	•	•								•		
7.	•	•	•										
8.	•	•											
9.	•	•	•										
10.	•	•	•										
11.	•	•	•										
12.	•	•	•	•	•								
13.	•	•	•										
14.	•	•											
15.	•	•	•					•	•	•			
16.	•			•									
Chronological associations													
1.	•	•											
2.	•	•											
3.	•	•	•										
4.	•	•	•										
5.	•	•	•										
6.	•	•	•										
7.	•	•	•										
8.	•	•	•										
9.	•	•	•										
10.	•	•	•										
11.	•	•		•									
12.	•	•		•									
13.	•	•		•									
14.	•	•	•	•	•								
15.	•	•	•	•	•								
16.	•	•	•									•	
17.	•	•	•									•	
18.	•	•	•										
19.	•	•	•										
20.	•	•	•	•	•								
21.	•	•	•	•	•								
22.	•	•	•										
23.	•	•	•										
24.	•		•						•		•		
25.	•	•	•	•				•					
26.	•	•	•										
27.	•	•	•	•									
28.	•	•	•										
29.	•		•										
30.	•	•	•	•	•		•						
31.	•	•	•	•	•				•				
32.	•	•											
33.	•	•	•						•				
34.	•	•	•										
35.	•	•	•	•	•								
Total no. of instances	35	33	30	10	6	1	0	0	1	1	1	2	

TABLE 4





father and two of his three children took up residence with the father's mother; the third and eldest child remained with his maternal grandmother.

In Shipaulovi there are two unmarried, unmated mothers both living with their parents (4, 5): in Mishongnovi there are four, of whom two live with their parents, (20, 21); one is a mother's sister's child in the household (24) and the other a daughter's child (30). These are all quite young mothers in their early twenties who will no doubt acquire mates in the usual manner.

In the categories mother's sister's children (Column 8) and mother's sister's daughter's children (Column 9), the mother's sister is deceased in every instance but one (household 15, mentioned above). Similarly, in Column 12, mother's mother's sister is in both cases deceased.

The seven cases in Shipaulovi where mother's brother resides with his sister include nine mother's brothers: one is a widower, one a divorced man, one a bachelor, and six youths whose own mothers are deceased. The five Mishongnovi cases, embracing seven mother's brothers, include four widowers and three youths whose own mothers are deceased. The total of twelve cases of this type (16 individuals) in the two villages is outstandingly large by comparison with most of the other totals outside the biological family. It is a matter of accident that the number of mother's brothers is numerically out of proportion to the number of mother's sisters in that first, only one of the nine youthful mother's brothers has a youthful sister (Shipaulovi, 15), and that second, the number of male adults in the two villages is higher than that of female adults. All other mother's sisters, excepting one, are either married and living in separate households, or deceased. The five mother's brothers who are widowers account for slightly less than one-third of all the widowers now unmated in the two villages. Besides the one who is a mother's brother in household 12, Shipaulovi, there is another divorced, unmated male living with relatives, father's father in household 11, Shipaulovi.

The three mother's mother's brothers (Column 14) residing with their sister's daughters are all widowers. The mother's mother (Column 15) living with her daughter is a widow. Mother's mother's sister's daughter's child (Column 17) is a boy who has until recently lived with his deceased mother's mother; he moved to his mother's sister's daughter's home because her husband needed extra help, a not unusual reason for the infrequent changes of residence.

The total number of persons whose place of residence accords with the strict matrilocal rule (Columns 1 to 17; excepting two children, sons

married to foreign wives living with the husband's mothers: Mishongnovi households 28, 29) is 320, or 94.3% of the total population of the two villages.[6] The percentages for the two villages are practically equal, 94% residing matrilocally in Shipaulovi and 94.5% in Mishongnovi. The remaining individuals, 6 in Shipaulovi and 13 in Mishongnovi, are included in Columns 18 to 24 of the table (again excepting the two married sons in Mishongnovi households 28, 29). By way of explanation of some of these apparently anomalous domiciles the following comments are offered. The two son's children (Mishongnovi, 27) might have resided with their maternal grandmother as does their older brother but for the fact that the paternal grandmother, old, and nearly blind, needed help in the household. For the choice of residence by five of the seven mother's fathers living with their daughters I have no explanation other than personal preference, possibly combined with an economic reason in some cases, since their respective clans (Butterfly, Bear, Water, Sun's-Forehead) are sufficiently strong to provide a home easily for the individuals in question. The same explanation must hold for two additional fathers living with their daughters who belong to clans which could have sheltered them, though not so easily. One of these men stays with his daughter (Shipaulovi, 9) who lives in a house owned by his clan. This household includes also the one man, a widower, resident with his brother's daughter (Column 20). The father's father (Column 21) living with his daughter-in-law in Shipaulovi (11) is a member of a Mishongnovi clan (Pumpkin) which is not so weak that it could not house another person. Two of the father's sister's children (22), whose mother is deceased, are members of one of the strongest Mishongnovi clans (Bluebird); the other (23), whose mother also is deceased, is a member of the Katsina clan which has nearly died out, the only other member in the village being the lad's maternal uncle in whose wife's household he lives. The female child (Column 25) adopted by a clan brother of her mother and his childless wife (Shipaulovi, 8) was one of many children in a household of the strong Mishongnovi Bear clan. In practically every instance, excepting the boy of the Katsina clan and the two foreign wives, totalling 3 out of 19 cases, it would have been possible for these individuals to follow the matrilocal rule of residence. Unfortunately, I cannot give the reason in most of the cases why the rule was not followed. Nor do I know how frequently this variation from the pattern occurred in the past, but on the basis, at least, of what little information there is on the dying

[6] Of the 36 Hopi residing at the Mission, 29 or 81.5% reside matrilocally, a figure notably lower than that for the two villages.

out and merging of clans, I suspect that there may be precedent for it. Neither my informant on these census data nor any other person ever expressed any condemnation of these "infractions" of the rule. I note that there is one Mishongnovi woman whose daughter lives with her father in another village (Shimopovi); the only reason given is that the daughter prefers to stay with her father. There is no instance of a Hopi wife's residing in the household of her mother-in-law, an arrangement noted by Kroeber as not infrequent at Zuñi.[7]

MARRIAGE

The living together of man and woman in one household constitutes a Hopi marriage. The Hopi vocabulary does not distinguish a couple ritually or legally united from one living together without benefit of ceremony. A married couple is described simply as a·mu'm ḳaDī'βDI'ĭ', "staying together." I follow in this context the Hopi definition of marriage. Table 5 is an analysis of the fifty-seven marriages in the two villages with reference to the nature of the union and the marital status of the mates. The caption Hopi means married according to the native ritual. Civil designates a couple married according to American civil law. Where neither Hopi nor civil occurs, the couple has not been ceremonially united. The terms widow, widower, divorcée, and divorcé involve in every instance a previous Hopi marriage. The term maid is defined below.

TABLE 5

	Hopi	*Hopi and Civil*	*Hopi and Civil of Widower with Maid*	*Civil*	*Civil of Widower with Widow*	*Civil of Divorcé with Maid*	*Widower with Widow*	*Widower with Maid*	*Widower with Divorcée*	*Divorcé with Divorcée*
Ship., No. of couples	6	7	0	1	2	0	0	0	1	1
Mish., No. of couples	17	9	1	3	0	1	6	1	0	1
	23	16	1	4	2	1	6	1	1	2

The native ritual marriage occurs, in almost every case, while the couple is still quite young. From the number and relative ages of their

[7] *Ibid.*, 105.

children, and from my acquaintance with the individuals themselves, I judge that the twenty-three couples who have been married in the Hopi way only are all either approaching middle age or are definitely old. This means that these twenty-three unions have endured for a long period of time. I do not know whether there have been in the past temporary separations, and if so, how many, in any of these cases; there is no reason, however, to believe that estrangements occurred frequently. Of the sixteen couples married both by Hopi rite and by law, six are, in my reckoning, either at or nearing middle age; the remaining younger couples are not without substantial families (from one to four children) and, since I know of no young divorced man or woman, I see no reason to expect that these Hopi unions based on native ritual marriage will not also remain stable.

The civil marriages, of course, have been indulged in mainly by the more sophisticated of the men and women. The civil marriage is not legally binding on the Hopi but I have no data on the effect of the legal tie on the relative stability of the union. The four couples married by law only and without previous marital status include one young couple who have been working off the reservation at intervals and who will probably have a Hopi marriage whenever it is convenient, one Christian couple living within Mishongnovi village, and the two couples of which the wives are foreigners (one Pima, the other Papago). There is a third couple of which the wife is a foreigner (Shasta), but my informant stated, perhaps incorrectly, that this couple was married in the Hopi way, and I have listed it in that category.

The table shows that in two instances widow and widower have been married by civil law. This is not often the case, as is seen from the number of widows and widowers mated without ceremony. There is a good reason for the fact that a person is rarely married twice by Hopi ritual. There is only one person in this category in the two villages. Hopi belief is that if a woman marries in the Hopi way a man himself previously so married, none of the wedding garments is hers to secure the passage of her soul to the adults' afterworld; "she has nothing," everything belongs to the first wife, even though the latter is dead. She remains a maid as far as the after-life is concerned and is regarded as a poor unfortunate by her tribesmen. A man who marries in the Hopi way a woman who has been previously so married, would be punished in the after-life. There is no instance of this in either village today. The instance of Hopi marriage between widower and maid included a civil marriage as well as the native one. In the case of the civil union of divorcé with maid, the wife (a Hopi) was previously married to, and divorced from, a Kiowa off the reservation,

and it is my uncertain impression that this earlier marriage, in some fashion not clear, mitigates her situation in the minds of her fellows. Though I have not heard it deplored, the fact is, nevertheless, that she has never been married in the Hopi way, which normally means that she likewise would have nothing when she died. The case of union between widower and maid without ceremony is most deplorable from the Hopi viewpoint: the wife not only has no wedding robe but the widower in question is her stepfather, and it would seem, on the whole, to be an unusual and ill-favored union. These three irregular marriages are all in the larger village and constitute 7.7% of all Mishongnovi marriages.

Table 6 shows the number of persons now unattached who have been married according to Hopi ritual and the number of bachelors, men well on toward middle age who have never married. There is no really old man in either village who has never been married in the Hopi way.

TABLE 6

	Widowers	*Divorcés*	*Widows*	*Divorcées*	*Bachelors*	*Spinsters*
Shipaulovi	7	2	2	0	1	0
Mishongnovi	11	0	1	1	1	0
	18	2	3	1	2	0

There are now sufficient facts and implications to substantiate certain conclusions. Of the total of 140 persons who either have been married or are bachelors, 128, or 91.4%, have been married according to Hopi ritual. Of the remaining 12 individuals two are the bachelors, two are Christians, two are young mates with a Hopi wedding ahead of them, two are foreign wives, two the husbands of these foreign wives, and the remaining two are the maids, who though mated are not married in the Hopi fashion. This high percentage of persons married at some time in the Hopi way demonstrates the strength even today of the native marriage pattern and the ideology behind it.

There are nine individuals of the 140 under consideration whose "Hopi" marriages were broken by divorce, a percentage of 6.4. I cannot calculate the divorce rate per one hundred marriages since the unions ended by divorce or death involve persons who are now remarried. Data on the frequency of divorce among couples married by neither Hopi nor civil rites were not obtained in this connection: I doubt whether they could be accurate in any case. Dr Parsons has coined the expression "brittle monogamy" to characterize Zuñi and Hopi marriage. On the basis of the data presented above and in the light also of what an investigator in-

evitably learns, not only of the economic coöperation in the household but of the psychological reality of the bond of affection that grows up between marriage partners, the term with all its implications hardly seems justified or apt for the two villages under consideration. Monogamy is the pattern, certainly, for these Hopi marriages. In theory divorce is an easy matter, but if "brittle" refers to that which breaks easily and often, then the term may not be correctly applied to marriage in Shipaulovi and Mishongnovi. There may possibly be some justification for applying the term to the ten marriages last discussed. But insofar as these latter constitute only 17.5% of the total number of marriages, and insofar, again, as it is my feeling that it is not clearly demonstrated by the data that these unions do not possess stability, these marriages can hardly be considered typically "brittle" Hopi marriages.

CLAN CENSUS DATA

Though I made no special study of clanship in these villages, the census material contains certain relevant data which have interest when compared with the results of Dr Lowie's thorough study of these two (and other) villages.[8] In the following table giving the clan census for 1934, I adopt the current English translation of the Hopi clan name, though it may not always express the current Hopi usage and even though it is not the most accurate translation. I have indicated the clan names which differ, however slightly, from those given by Lowie. In those instances where Lowie's information distinguished between the membership of two linked clans (e.g., between Chicken-Hawk and Eagle) which are now so completely merged that my informant, at least, did not make any distinction, I in-

TABLE 7

	Census of Shipaulovi Clans		
	Resident in Shipaulovi	*Married men, Resident Elsewhere*	*Christians, Resident at Mission*
Sun's-Forehead (Lowie, Qálö[95])	51	9	15
Bear (16)	17	—	1
Reed	5	1	10
Pumpkin	4	—	—
Butterfly	5	—	—

[8] Notes on Hopi Clans (Anthropological Papers, American Museum of Natural History, Vol. 30, Pt. 6, 1929), p. 317 ff.

dicate this as, e.g., Eagle (Lowie, Chicken-Hawk+Eagle). The figure in parenthesis after the clan name is the total of the clan membership in 1916 as given by Lowie.

Since 1916 three new clans have arisen in Shipaulovi. The information obtained on the point, though scanty, may have some bearing on the history of Hopi clans. The manner (though not the cause) in which these new clans have established themselves, is clear in the case of Pumpkin and Butterfly clans: one Mishongnovi woman belonging to each of these clans moved to Shipaulovi. The Pumpkin clanswoman, now old, is married by Hopi ritual to a Shipaulovi Bear clansman. I do not know whether the house she lives in belonged in the first place to the Bear clan or whether it is now considered as her own house. The Butterfly clanswoman whose husband is a Mishongnovi Eagle clansman lives in a house which belonged to the clan (Sun's-Forehead) of her father who stays with her: again, I do not know whether native opinion deems her owner or merely temporary occupant. The reason for her having taken up residence in Shipaulovi may relate to the size of her own clan (Mishongnovi Butterfly) which possibly suffers from a shortage of houses. Since she and her husband are young, there is yet time for them to build a new house on a desirable site below the village: whether they build on the Mishongnovi or on the Shipaulovi side, will finally decide whether Shipaulovi is permanently to have a new clan.

The case of the Reed clan is more puzzling. My informant's explanation is given in full. Not many years since, the Shipaulovi woman now at the head of the single Reed clan household broke with the Sun's-Forehead clan of which she was a member and started calling herself and children Reed clan people. The Sun's-Forehead clan (of which my informant is a member) was apparently glad of the break for, according to Irene, the woman and her family are queer people, to say the least. The Sun's-Forehead and Reed people do not even "go together" (a·mī′mīm^{i}a') now, in the sense that linked clans "go together" (as, e.g., in the naming rite), for the former will have nothing to do with the latter and possibly the reverse is also true. Whatever the whole story may be, my informant was certain that the present Reed clan mother is no recent immigrant to Shipaulovi, and that she was previously a member of the Sun's-Forehead clan. The fact that a Shipaulovi Sun's-Forehead clanswoman is married to an Oraibi Reed clansman suggests that these clans were not formerly considered to be linked clans. Within Shipaulovi there is only this one lineage in the Reed clan. My informant, however, designated two Christian women who reside at the Mission as Reed clanswomen. One is a middle-

aged woman, the other somewhat younger. I did not inquire the nature of their relationship to the Reed clan mother or whether they had moved from the village prior to the establishment of the Reed clan in Shipaulovi.[9]

The Mishongnovi clan census (table 8) shows that the size of the clans has remained relatively stable since 1916. The Badger clan has, however,

TABLE 8

Census of Mishongnovi Clans

	Resident in Mishongnovi	*Married, Resident Elsewhere*	*Christians, Resident at Mission*
Butterfly (26)	38	1	0
Bear (42)	31(+1 Christian)	3	1
Corn (26)	26 (+1 Christian)	2 (+1 in town)	0
Bluebird (Lowie, Tcō'cu [22]+ Carrying-Strap [10])	26	2	1
Eagle (Lowie, Chicken-Hawk [37] +Eagle [3])	21	4	0
Water (Lowie, Cloud [17])	19	3	0
Coyote (Lowie, Cedarwood-Fire [22])	19	(1 woman, in town)	0
Pumpkin (Lowie, Squash [13])	13	1	2
Parrot (16)	9	2	3
Snake (Lowie, Lizard [11])	9	1	0
Badger (15)	6	0	1
Katsina (5)	2	1	0

suffered serious depletion, and its future depends entirely on one young girl whose only sister is being raised at the Mission. The Parrot and Katsina clans are definitely dying out: there is no longer a woman in the Katsina clan and only two old women without daughters in the Parrot clan. According to my informant, no new linkage of these clans with others more flourishing is yet apparent. Five of the clanless individuals in Mishongnovi are the children of a foreign mother and a Katsina clansman. Should they ever affiliate with any clan it may possibly be with the Katsina clan.

Apart from the mergings (if my informant is correct) where there were formerly but linkages, there is only this to add to Lowie's data: my in-

[9] Dr Lowie has suggested to me that the Shipaulovi Reed clan may have been one lineage within the Sun's-Forehead clan.

TABLE 9

Shipaulovi Interclan, Intervillage Marriages

Shipaulovi Wives	*Shipaulovi Husbands*					*Mishongnovi Husbands*							*Shimopovi*		*Oraibi*	*Hotavilla*
	Sun's Forehead	Bear	Reed	Pumpkin	Butterfly	Bear	Water	Eagle	Bluebird	Pumpkin	Katsina	Snake	Katsina	Water	Reed	Katsina
Sun's forehead		1				2	1		2	1	1		2		1	
Bear												1		1		1
Reed						1										
Pumpkin		1						1								
Butterfly								1								

Mishongnovi Interclan, Intervillage Marriages

Mishongnovi Wives	*Mishongnovi Husbands*												*Shipaulovi*		*Hano*		*Shimopovi*
	Butterfly	Bear	Corn	Bluebird	Eagle	Water	Coyote	Pumpkin	Parrot	Snake	Badger	Katsina	Sun's Forehead	Reed	Bear	Cottonwood	Snow
Butterfly		1	1		1				1				2				1
Bear					1	1	1	1			1						
Corn		2		1			1										
Bluebird					1		1		1		1		1	1			
Eagle	1	1	1														
Water	1			1						1							
Coyote					1								1			1	
Pumpkin													2				
Parrot										1					1		
Snake																	
Badger					1												
Katsina																	

formant stated that the Sun's-Forehead and Eagle clans are linked, "go together;" her statement is borne out insofar as neither Lowie, nor I, has record of an intermarriage between these clans. This may be additional evidence to Lowie's that the existence in Shipaulovi in 1916 of only two clans was the result of a "secondary reduction in the number of clans,"[10] the linkage having been extended from a now extinct Shipaulovi Eagle clan to the Mishongnovi Eagle clan. I have found it impossible to collect any new data on the number of maternal lineages within the individual clans: my informant was loath to speak of the dead and I could not get genealogies.

The interclan and intervillage marriages in Mishongnovi and Shipaulovi are given in Table 9. I do not have information on the clan membership of the wives from other villages married to Shipaulovi and Mishongnovi men. The table substantiates the rule of the exogamy of linked clans. The record of intervillage marriages shows the same strong tendencies noted by Lowie: a high percentage of intermarriage between Mishongnovi and Shipaulovi, and for Shipaulovi, a relatively large number of intermarriages with Shimopovi, its parent village on Second Mesa.

HONOLULU
HAWAII

[10] *Ibid.*, 325.

THE SOCIAL DIVISIONS AND ECONOMIC LIFE OF THE WESTERN APACHE

By GRENVILLE GOODWIN

BY WAY of introduction it would be best to explain what peoples are included by the term Western Apache. The term is here used to designate all those Apache peoples who have lived within the present boundaries of the state of Arizona during historic times, with the exception of the Chiricahua, Warm Springs, and allied Apache, and a small band of Apaches known as the Apaches Mansos, who lived in the vicinity of Tucson. The various peoples thus classed together as the Western Apache are apparently enough like each other, and different from other Apache peoples in certain aspects of their culture, to give reason for placing them in a division by themselves.[1]

SOCIAL DIVISIONS

At the time of the first American occupation of their territory (middle of nineteenth century) the six thousand or so people comprising the Western Apache were divided into five distinct groups,[2] each having its own territory. These groups were: (1) White Mountain Apache, (2) Cibecue Apache, (3) San Carlos Apache, (4) Southern Tonto Apache, (5) Northern Tonto Apache.[3] The five groups felt themselves to be quite distinct from one another, and hostility between certain of them was not unknown. However, among people of the same group there was a fairly close feeling of relationship in custom and speech. It was this that held them together and not any political unity.

Each one of the five groups was in turn broken up into bands or semi-bands. These bands were not equally distinct nor as strongly formed in

[1] The material upon which this paper is based has been collected during the years 1930–1933 under the auspices of the University of Arizona, in a project which entails the study of the culture of the Western Apache now living on the San Carlos and White Mountain Indian Reservations, and at various settlements off the reservations in the state of Arizona, near Camp Verde, Payson, etc.

[2] The terms "tribe" or "tribal group" may possibly be more suitable than "group," but the latter is here used until some one term becomes established for designation of these Western Apache units.

[3] The reasons for the naming of these five groups in the above manner, as well as for naming the bands as they are on the map, is not here explained. The whole subject is fully discussed in a manuscript now completed on the social organization of the Western Apache, which will be published shortly. The three westernmost bands of the Northern Tonto Apache intermingled with Yavapai people who shared the region with them.

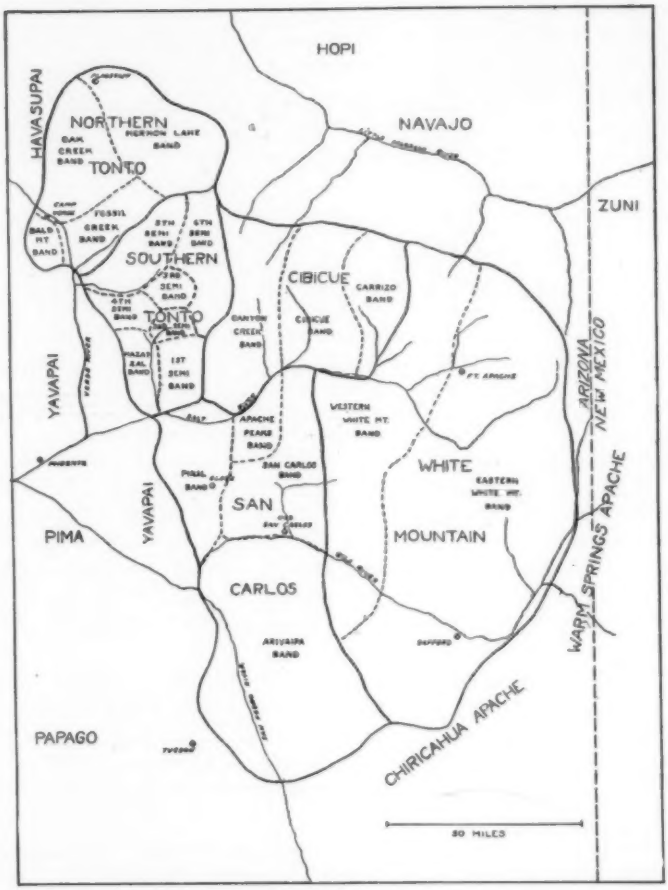


FIG. 1. The distribution of the Western Apache groups, bands, and semi-bands in east-central Arizona. (Erratum: For Cibicue read Cibecue)

all groups. The formations among the Southern Tonto cannot really be called bands in comparison with those of some of the other groups, and are thus termed semi-bands for convenience. Bands and semi-bands again each had their own territory and refrained from encroaching on that of their neighbors. Though the unity within a band or semi-band was naturally more intense than that within a whole group, still the people were not a political unit, and were mainly held together by common custom and clan and blood relationship.

The next unit below the band was the local group. Every band or semi-band was composed of several local groups, each having its own territory. The local group was the basic unit upon which the social organization and government of the Western Apache was built. Each local group had its own chief who led his people and directed it in matters of importance, such as war or raiding parties, food gathering expeditions, farming projects, and relations with other local groups or foreign tribes. Chiefs did not have supreme power, but instead led their people mainly by prestige and good example: attributes for which they were chosen as leaders.

Beside the chief there was another leader in the local group: the head woman or woman chief, as she was sometimes called. Her function was to counsel those about her in the ways of living and especially to organize wild-food gathering parties among the women.

In a local group there were from nine to perhaps thirty houses, and the majority of people in these generally belonged to the same clan, though some might be blood relatives of other clans, relatives by marriage, or even unrelated. This strong clan and blood relationship within the local groups was what really made them such closely knit units.

Within the local group were several family groups, say from three to six in number. These family groups were in turn made up of from three to eight households. The members of a family group were usually related within the limit of second maternal cousin, though a few relatives by marriage would be included also. Each was controlled by a head man, who directed in almost the same way as a chief, and it was from the various head men within a local group that the chief was chosen. The family group was in reality almost a miniature local group, and naturally acted even more in unison. Often it operated as a separate unit in pursuit of economic ends for short periods of time, but never permanently.

Blood relationship among these people was and is a very strong bond, involving mutual aid and responsibility. Obligations thus entailed were felt to be stronger on the maternal side than on the paternal because of

matrilocal residence and the clan system. Blood relatives were considered close within the limit of second or third cousin, but beyond this strict observance of blood relationship obligations depended more on close association between the relatives concerned.

The clan system of the Western Apache is not so easy to fit into the sequence formed by the already described social divisions. Whereas each of the groups, bands and semi-bands, local groups, and family groups belonged to one area only, the clans formed cross strata of relationships which ran through the several groups, bands, etc., joining all together. Many of the clans were represented in more than one group.

Each clan had a name, usually of the place-name type, designating its legendary place of origin or first settlement. Children were born into the clan of their mother. All members of one clan were considered blood relatives and called each other by kinship terms identical with those of consanguinity. Marriage between members of the same clan was not countenanced, though marriage into the father's clan was permissible if the blood relationship was not too close. Members of the same clan were expected to aid each other in time of need, and if it was necessary the whole clan might be called together to avenge a wrong done to one of its members. However, there was no clan government or law beyond the obligations governing the actions of clan relatives to one another.

There existed a varying interrelation among the clans of all groups, and one clan might be related to another clan or several other clans. Between members of related clans the same rules of exogamy and mutual obligation held as between members of the same clan, though to a slightly less degree.

Within historic times, at least, the Western Apache clan was not primarily a territorial unit like the local group, though among certain of the bands there was a tendency to localization. The real power of the clan lay in its far flung web of interrelational obligations between its members in all the Western Apache groups.

Residence was usually matrilocal though not necessarily so. Generally neither boys nor girls married till they had proved themselves fully able to perform the tasks of men and women. In marriage proceedings between two families, the man's family first made a present to the girl's parents, and after that there might be mutual feasting and present-giving. When these evidences of friendliness and esteem were concluded, the young couple set up housekeeping for themselves. From the time of betrothal and marriage the obligations among relatives by marriage were strong, and there was a definite code for the various classes of affinal relatives with which an individual was expected to comply.

In former times a man might have more than one wife (usually not more than two or three) if he could support them, but in doing this he was expected to marry women who were of the same clan as his first wife (usually her true sisters, or daughters of her mother's sister). The same rule applied to a widower, and a widow was under obligation to marry a clan relative of her deceased husband (usually his true brother, or mother's sister's son).

When a man and woman were married, each had his share of the family work and providing. What this really amounted to was that the men did all the dangerous and very arduous or strenuous tasks (war, hunting, heavy digging or lifting, handling unruly livestock, etc.), while the women did all those things which did not require a man's strength and endurance (cooking and camp work, tanning, harvesting, etc.). Thus, though the women had the commonplace tasks, their lot kept them more steadily at work than did that of the men.

Children did not take a serious part in the culture of their people till they were about six years old. From that time on they were taught by their parents or relatives, so that they gradually became familiar with the things which they would have to know in later life. When they had reached the age of twelve or so, they took an active part in the procuring and preparation of foods, and henceforth their serious activities were increased.

The foregoing is a superficial description of the Western Apache social pattern, and it must be realized that it was merely a pattern, not a stereotyped program that the people followed regardless of all circumstances. Also it applies only to the social organization of these people within historic times, and up to the period when the United States Government first seriously started to interfere with the original balance of their culture (1871–1873), when the centralization of the Western Apache on government reservations was accomplished.

After the life on the reservations commenced, the old distinction between the groups began to break down, due to the people being thrown more closely together. At the present time group distinction plays a minor part, though the existence of a sort of rivalry between the descendants of different groups is still quite evident. The same is true of the bands and semi-bands, though with them the distinctions have lapsed even more.

The local group is no longer the close knit unit that it once was. The chiefs are gone, and their power, in great part, is now in the hands of the white agent and his employes. However, the family group still preserves a great deal of its old form. A head man directs the family affairs, and these head men still exert great influence in their communities. In the past

years it has been mainly through them that the people have dealt with the agency.

The clan system also remains partially intact. Thus, though marriage between related clans is sometimes allowed, marriage between members of the same clan is not.

Marriage and family life is much the same now as formerly, except that the presents and feasting at the time of a wedding are not considered strictly necessary, a marriage license and legal marriage ceremony are required by law, and a man may not have more than one wife. Remarriage obligations are still generally in force, as well as those between relatives-in-law. However, children do not take the part in the economic life which they used to take, because they are in school during several months of the year.

At the present time the real economic unit is the family group; the groups, bands and semi-bands, and local groups having given way to the modern, more sedentary, small farming and ranching communities, which are centralized at the seven or eight main farming locations on the San Carlos and White Mountain Reservations, and at two or three localities off these reservations.

ECONOMIC LIFE

To understand the economic life of the Western Apache it is necessary to know something of their natural environment. The country which comprised their historical territory can be roughly divided into two areas. The first lies in the southern and southwestern part of the territory, and is in general lower. It is a country of great open desert valleys, separated from each other by abruptly rising mountain ranges. In the valleys grow creosote bush, mesquite, yucca, chollas, sahuaro, etc., grading into oaks, junipers, and piñons on the lower slopes of the mountains. On the tops of the mountains are pines, some conifers, etc. The climate is hot in summer, mild in winter.

The second area is a more uniform upland country, averaging from five to seven thousand feet in altitude, and covered with growths of oak, juniper, and piñon. It was in this type of country that the people formerly lived during the greater part of the year. The mountains are fewer and less rugged, but higher in altitude than those in the first area. On them are thick stands of pine, conifers, etc. The climate is pleasant in summer, but from November to March and sometimes April the weather is fairly cold, with snowfalls not infrequent.

The climate is generally arid in both lower and higher areas. However,

there are certain rainy seasons: in the last part of July and during August, and again during some of the winter months. The varying altitudes throughout both areas gave rise to differences in the character of the country and plant and animal life, thus affording a variety of foods.

The Western Apache had four sources from which to obtain food: wild animals and birds, wild plants, domesticated plants raised on the small farms, and livestock and agricultural products which could be taken in trade or in raids on neighboring peoples. The last source was the least important, as it was easier to obtain food at home. Its main value lay in the fact that horses, mules, burros, and cattle could be captured from the Mexican settlements in the south, and sheep and goats from the Navajo in the north to be butchered and used as food.

Of meat and plant foods, meat formed roughly about thirty-five to forty percent of the whole, plant foods about sixty to sixty-five percent. This percentage naturally fluctuated throughout the year according to the abundance of game and crops. Of edible game there used to be several kinds: bear, deer, antelope, some mountain sheep and elk as well as smaller game like rabbits, rats, squirrels, and certain birds. The larger quarry was hunted with the bow and arrow; the smaller was snared or shot with arrows, mostly by boys.

Men occupied much of their time in desultory hunting, but there were two principal seasons when hunting was given particular attention. These were late spring and fall. Late spring was a good time to hunt, coming as it did between planting and the first wild food crops of July, when the women would have time to care for hides and meat. Fall was even better, as meat and hides were prime, and a man could leave his family safely at the farms, there being nothing much to do at home. It was in the fall that the big hunting parties set out. They were not highly organized affairs, but composed only of a few men under the leadership of one of the party. Women did not usually accompany them, but instead the men butchered and skinned the carcasses, and packed the meat home to the women on horseback. This was possible because the hunting parties were only gone a few days and never ranged very far from home.

Of the sixty to sixty-five percent of plant food of the total food consumed during the year, about thirty-five to forty percent consisted of wild plant foods and the remaining twenty to twenty-five percent of domesticated plant foods. This proportion applied to those who had farms of average size. Among those who had no farms the domesticated plant foods used were only the few obtained by trade. Thus with the non-farmers the percentage of wild plant foods used was high, often the full sixty to

sixty-five percent. There were many wild food plants, and during the whole growing season (April to November) one or several plants were always available for food. Even in winter there was the mescal which could be roasted and eaten. Certain plants were staples: mescal, sahuaro fruit, acorns, mesquite beans, fruit of Spanish bayonet, sunflower seeds, fruit of prickly pear, piñon nuts, and juniper berries. Of these nine, mescal and acorns were the most important.

In the spring parties set out for the lower country to gather and prepare mescal. In July the sahuaro fruit was ripe there and also certain of the prickly pears. Late July and August was the season for gathering acorns, summer that for mesquite beans. Later, in early September the Spanish bayonet fruit was ripe. When October and November came, the last crops, piñon nuts and juniper berries, were harvested.

As the food was gathered it was either eaten or stored for winter. Storage was usually in caves in sealed olla-shaped baskets, or in the dwellings of the families themselves.

Since most of the principal plant foods grew at different altitudes, it was necessary to keep moving from place to place to harvest them. These journeys lasted from ten days to a month, and as many women and girls were needed to help, the whole family usually went along. However, the men spent the time hunting, as it was not their task to help gather and prepare any of the wild plants except mescal.

Among the Western Apache every family did not have a farm. The farming opportunities of the area varied and even some families who could have did not wish to farm. In the northwestern part of the area many of the people did not farm because of their exposed position to enemy tribes and the resulting danger of living on farming sites. The varying degrees in the amount of agricultural activity between the several groups stands out best when a comparison is made. Among both bands of the White Mountain group and all three bands of the Cibecue group most of the local groups farmed. Among the four bands of the San Carlos group, and the second, third, fifth, and sixth semi-bands of the Southern Tonto group the majority of local groups had farms. In the Mazatzal band and the first and fourth semi-bands of the Southern Tonto group only about half the local groups farmed. Of two bands of the Northern Tonto group the majority of local groups did not farm, and in the other two there was no farming at all.

Farming, as can be seen, was not necessarily carried on by all families in one group, band or semi-band, or clan, but it is true that if some of the families in a local group farmed then the majority of families of that local

group did, usually all at the same site. This does not mean that the farm was a local group institution. It pertained essentially to the family.

Among these people agriculture was not a complex affair. Fields were small: about half an acre or so, often less. On them were raised corn, some beans, squash, and later wheat, but corn was the main crop and formed a staple food. Clearing and tilling fields was done with the digging stick, and in seeding, the planting stick was used. Farming sites located in country high enough to get sufficient rainfall were not irrigated, but those in low country were and the neighbors helped each other in the construction of dams and ditches. Preparing the fields and planting took about a month. All the members of the family group were expected to help if needed. When the corn was about three feet tall, most of the people moved away for the summer to harvest the various wild plant foods. In September they returned to harvest and store the crops, this again taking about one month's time. Much of the corn was stored in large ground caches for future use.

After harvest part of the population remained at the farms, and part moved down to lower country to escape cold weather and to be within close raiding distance of enemy settlements. Though away from the farms for much of the year, yet these were the places that the people considered their real homes.

The old way of life of the Western Apache shows that these people had a mixture of three modes of living. They hunted large game, but did not depend on meat to such a degree that they ever exhausted or drove the game from their territory and had to go long distances for it. They farmed to some extent, but by no means enough so that they could depend on crops for sustenance throughout the year and so remain in one place. They made use of wild plant foods and small game, but this was not sufficient for them to forego the hunting of big game, though it did allow a minority of them to do without agriculture. Thus their existence kept them moving about within a limited territory in which they were able to practice all three ways of living and follow out their seasonal schedule.

One point of importance was the method of travel. In spite of accessibility to the Mexican ranches of Sonora, the horse never became indispensable in travel, and travel by foot still remained general. The horse was used very often as a pack animal. When families had to move on foot they packed their belongings on their backs in burden baskets. The Western Apache, it must be understood, were never a stock-raising people.

Though much of the population had semi-permanent homes at their farms, they moved too much from one place to another to develop

any of the arts that a more sedentary people might have. Their dome-shaped, brush-covered dwellings were easily reconstructed and set up in a new place when necessary. On account of frequent travel their belongings had to be conveniently transportable and thus, though they made some pottery, the art was never carried far. They did no textile weaving in cotton or wool, but made their clothing and blankets from skins. However, there was one real art which they did develop and which fitted perfectly to their mode of life. This was basketry; an art carried to perfection among them.

The old type of subsistence has not been given up altogether: even today a good many of the more common of the wild plant foods are used, mescal and acorns still being staple foods. However, due to lack of game, beef is now the principal meat food. In spite of the many changes of recent years the most popular type of dwelling is still the old style house.

Unfortunately the reliable material already published on the Western Apache is not abundant. What little there is deals mainly with separated aspects of their culture so that it is impossible to get a clear perspective of the people as a whole. Therefore it is interesting to look forward to the time when a thorough understanding of the Western Apache and their position in the Southwest can be made possible not only in relation to the other Apache peoples and the Navajo, but to the whole area.

SANTA FÉ
NEW MEXICO

THE CONCEPT OF SUPERNATURAL POWER AMONG THE CHIRICAHUA AND MESCALERO APACHES[1]

By M. E. OPLER

A NUMBER of my informants have introduced our discussions concerning Apache ritual with the statement: "The Apaches are a very religious people."

These informants know precisely what they mean by "religious." They mean that at every point of his life, the Apache seeks supernatural aid in meeting his problems and conducting his affairs.

"The Apache has help for everything against which he has to contend," is the way one native expressed it with no little pride. And in the days that followed this man abundantly justified his statement.

These supernatural aids to overcome the difficulties and emergencies of life take the form of ceremonies. Such ceremonies, though widely different in detail, are markedly similar in pattern. Very nearly all of them include preliminary ceremonial smoking, the throwing of pollen to the four directions, prayer, and a set of songs.

No matter what your straits, if you are an Apache, you can be sure that there is some ceremony designed to meet the situation. There are ceremonies to bring children to the childless; to aid the woman in difficult labor; to find lost objects. There is a ceremony conducted when a baby is first put into its cradle, another when the child first walks, still another when the young girl enters womanhood. Every disease has its curative rite. When contact with the white man demonstrated that his antics were wholly capricious and unpredictable, an effort was made to control them by supernatural agency, and so there exists even a ceremony to influence the white man. I understand that many an unsuspecting official and army officer has unwittingly yielded to its influence. While the United States Government was deciding whether or not to execute Geronimo, such a ceremony was conducted by the Indians, and my informants remind me that Geronimo finally died, unmolested and ripe with years, at Fort Still, Oklahoma.

It is not proposed to describe, in this paper, any of these numerous ceremonies. It is the intention, rather, to sketch, in broad outline, the ideological foundations upon which these specific ceremonies rest. The hope is that an appreciation of the idea system, of which the various rites and

[1] This paper was read at the meeting of the Southwestern Section of the American Anthropological Association which met in May, 1933, at Las Cruces, New Mexico.

religious activities are, after all, only channelized and concrete expressions, will pave the way for a more correct interpretation of the ceremonies themselves.

The Apaches conceive of a supreme deity, whose native name can be roughly translated as Giver-of-Life. Giver-of-Life is an impersonal deity, to whom no sex is attributed. Likewise, it is impossible to get a description of the appearance or place of abode of this god. As the name implies, Giver-of-Life is thought of as the creator, the maker of world and man, and the source of all supernatural power. Since the creation Giver-of-Life has had little direct contact with mankind.

Supernatural power, the supreme creation of Giver-of-Life, does reach mankind, and, as we shall see, exercises much control over worldly affairs. In contrast to supernatural power, Giver-of-Life is remote and nebulous to the Apache mind. One might say that this deity has been invoked to lend conceptual wholeness to the supernatural world of the Apache, if indeed the god's origin is not to be sought in Spanish or more recent missionary influence.

The power of Giver-of-Life becomes translated into specific ceremonies. It is these ceremonies which warmly and intimately impinge against Apache life. It is these ceremonies which dominate Apache religious thinking. Giver-of-Life may be mentioned in the opening prayer of a rite. Thereafter, however, the attention shifts to the specific power whose aid the ceremony is attempting to win.

Again, children who have had, of course, no power offered them, and who therefore have nothing to "live by" and no one to "talk to them," as the native phrases go, are sometimes taught by their parents to pray, at least in their hearts, to Giver-of-Life in gratitude for their lives, their creature comforts, and the natural beauties around them. An adult who has not accepted or who has not been offered a ceremony may likewise direct his prayers and thanks to Giver-of-Life.

As has been pointed out, the power of Giver-of-Life does not immediately spend itself in the government of human affairs, nor does Giver-of-Life act as a directing genius over supernatural power.

Power is thought of as a mighty force that pervades the universe. Some of it filters through to the hands of man. But to become manifest to man, power must approach him through the medium of certain agencies and channels, must "work through" something. The most conspicuous of these agencies are certain natural phenomena such as the lightning or sun, and a number of animals, principally the bear, snake, owl, and coyote. I have mentioned some of the more common media through which power is

obtained, but actually there are scores of possibilities. I have obtained descriptions of rites which were secured to man through the mediation of many plants, animals, and natural objects other than those which have been named here. In fact nothing is barred a priori from being a conductor of supernatural power, though the tendency to expect transmission through traditional and well-known channels is strong.

One point which should be emphasized is that every Apache, man or woman, is a potential recipient of supernatural power. Theoretically, at least, no one knows in advance what power may be offered to him or when it may be offered. Then one day a person may have "something speak to him." It may be in a dream; it may be when he is alone in his camp; it may be when he is with a crowd of his fellows. The words or the vision are for him alone. Others, though present, will not see or hear them.

Now follows a very novel and enlightening episode. Perhaps Bear is appearing to a man with its offer of power to cure "bear sickness," a malady marked by deformity and occurring when an individual is frightened or attacked by a bear, or has unknowingly crossed a bear's tracks, touched bear fur, or invaded a bear's den.

Bear informs the man selected that he has watched him closely and has decided that he is the proper person through whom to work and do much good. The listener is careful not to appear too eager for the power. He reminds Bear that there are many other people nearby and modestly suggests that some of them must be more suitable than he.

To this argument the power returns a soothing reply. No one will do but the man selected. He has been especially singled out from among all his fellows. The power will give him and his family long life, will provide him with the means of doing good so long as he lives.

An Apache may accept or reject the power thus offered. If he accepts he is given directions for conducting a ceremony: he is instructed in the songs, the prayers, the four ceremonial gifts he must ask in return for his services, and the taboos, if any, which he must observe himself and impose on the one for whom he is working.

At a later date this same Apache may be approached by another and different power, and he may accept this second ceremony too. I have recorded five different ceremonies for one man now living, and several for a number of other individuals. Thus it is that an Apache becomes "loaded up with powers," as one informant put it.

It is not necessary for a man who has a power to inform others of it. Very often none but a man's own family will know of his ceremony, and this ceremony will be used in behalf of the family only. "A man's power is

not public property. A man with power is not a public man," I have been told. When, however, an individual has consented to conduct his rite in the interests of those outside his family, and with conspicuous success, his services may thereafter be in great demand.

As the mode of transmission would suggest, there is no one version of bear ceremony, lightning ceremony, etc. There may be several individuals, as is now the case with many of these rites, who have the right to conduct ceremonies which bear the same name and have the same purpose; yet these ceremonies will all differ in songs and ritual detail. There are on the Mescalero Reservation today several men who have the important right of painting masked dancers. The purpose for which they perform their task is the same, but their songs, designs, and procedure differ considerably.

It must not be thought that because traffic with a supernatural power is a personal matter, dependent upon the individual's own account, the native will consciously claim for himself experiences never really attained. One of the most poignant beliefs is that performance of a ceremony to which one has not the supernatural right proves fatal to the simulator and most unfortunate for his family. My informants would not even sing a ceremonial song which was not their own without an elaborate explanation in prayer to the power, pointing out that the song was not being sung ceremonially but just for illustrative purposes to accommodate a friend.

In order to practise a ceremony it is not necessary to obtain the rite at first hand from the power. A ceremony can be transmitted from one person to another, usually from an elder to one of the younger people, in order that it be carried on to the next generation. But the transfer must be in accordance with the wishes of the power. Not long ago a middle-aged man dreamed of the masked dancers of a very old painter of the gą'hé', as the masked dancers are called. He took this as a sign that he was destined to carry on this rite and so approached the old man. The old man at once began instructing him in the prayers and songs. The younger man learned them with ease within four days, and this is the accepted test of whether or not the power is willing to "work through" one. Later the old man prayed and sang to his power, asking whether it was the wish of the power to use the novice as its instrument. He received an affirmative reply, and now the two conduct the rite jointly. More and more the major part of the work is done by the younger man. The older man may discontinue his activities altogether soon and retire, so to speak. If he continues assisting until his death, the younger man will perform the ceremony alone thereafter. The mechanics of this particular transfer are typical of those which occur in the transference of all other ceremonies.

It is held desirable to bequeath ceremonies to someone in the family. Wherever possible the ceremony passes from parent to child or from grandparent to grandchild. When the ceremony is transferred to a member of the family, very often no payment is required beyond the ceremonial presents which must always be offered to the power; but when the ceremony is taught to one outside the family circle, a fee always is exacted by the teacher in addition.

I have purposely refrained from giving the word for supernatural power, because there is no one Apache term for it. Supernatural power is neither necessarily beneficial nor harmful. Its potential nature is dual. It may be one or the other. All that is certain is that power is wonderful, capable of accomplishing extraordinary things. The Apaches account for death, disease, and disaster when power is manipulated by malevolent persons or when power itself seeks to do harm. Such harmful supernatural power and the individuals who direct it or lend themselves to it are called 'ɛ̀n'tį́"; 'beneficial supernatural power and those who carry on its ceremonies are called dìγį̀.

It would exceed the limits of this brief outline to discuss the many interesting aspects of this duality. I will confine my remarks to one point, the psychological implications of which have rather fascinated me.

It is believed that if you practise a ceremony with unusual success for many years, in the end your power will demand that you sacrifice to it one of your near relatives or you yourself must die. If you consent to the sacrifice, the relative will soon afterwards fall in battle or will become the victim of some inconspicuous accident. The death seems natural; actually you have permitted the man to die in your stead.

So strong is this belief that many Apaches live in decided fear of relatives who practise cures consistently. I know a man who is mortally afraid of his own father's power.

The social and economic system of the Apaches has the family as its nucleus. It is important that there be no open dissention or hatred between members to strain the unity of the familial structure. Yet the Apache, like many others, does not always have equal admiration for everyone in his family. I wonder, then, whether we may not look at the fear of a close relative's power as a mechanism by which Apache society permits an honest dislike, which would be ruinous if expressed in social terms, to be expressed in terms of the supernatural.

It will be noted that the picture here given of Apache religion departs considerably from the traditional norm. It has been the practice of travellers and Indian fighters to talk of Apache ceremonial life in terms of "medi-

cine-men." These were supposed to be a few individuals set off from their fellows by their esoteric ritual practices and wielding a power in tribal affairs out of all proportion to their numbers.

I think that we shall have to abandon the use of the word "medicine-man" or acknowledge that the Apaches are a nation of medicine-men. I have worked among three Apache tribes, and I have found scarcely a person of middle age who is not the custodian of some ceremony and the recipient of some supernatural power. Each individual plays his part in the great economy of ritual. One has the songs which must be sung when the war shield and spear are made. Another can raise a dust storm and save his people from detection by the enemy. Another can cure the loathsome sores that attack the face when "snake sickness" is contracted. Each has his feeling of importance. Each is buoyed up by the knowledge that "he who speaks to him" will guide, advise, and protect him.

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AN ANALYSIS OF THE MATERIAL CULTURE OF THE TUPI PEOPLES

By S. KLIMEK AND W. MILKE

I

THE object of this work is a structural analysis of the material culture of the Tupi tribes in South America, and finally a culture history of this family of peoples. The tabular compilations, which Alfred Métraux added to his book *La civilisation matérielle des tribus Tupi-Guarani* (Paris, 1928), have furnished us the material for this research.[1] Métraux is a student of E. Nordenskiöld. His work bears all the characteristic marks of the Swedish school: an immense industry, an extensive reading; on the other hand, a not always fortunate typology, and not infrequently carelessness difficult to understand.[2] In spite of this, it stands almost unique in ethnographical literature because it registers tabularly the presence and the absence of a large number of culture elements for a large group of peoples. Only by reason of its existence was it possible for us to produce an exact method for use in culture historical problems.

2. Ethnology directed to historical problems has set as its aim the recognition of the past through the present and the explanation of the present through the past. In order to satisfy this high aim, it must, first of all, bring order into the endless ethnographical material. First it attempts to comprehend the grouping of peoples through the criteria of form and quantity, and then the grouping of the cultural elements through the criterion of distribution. The criterion of form and that of quantity are peculiar not only to historical but to all inductive sciences; the criterion of distribution was introduced into ethnological work by Frobenius, but above

[1] Métraux, pp. 295–300; p. 56.

[2] Attention should be drawn to a few cases. The statements in the table repeatedly differ from those of the text: e.g., according to the table (p. 295) fishing with poison is present among the Guarayu; according to the text (p. 92) it is absent. The same holds true concerning fishing by damming the streams. According to the table (p. 299) the Tupinamba lack the bow-net, but according to page 92 it is used by them. The harpoon, according to p. 300, is present among the Yuruna and Chipaya; according to p. 92 it is absent there. The spear-thrower is represented doubly in the large table; according to one statement it appears only among the Omagua, but according to the other also among the Aueto. This latter statement coincides with that in the text (p. 79); therefore we held it as authoritative. Compare further Maloka (pp. 295: 56), pile-work (pp. 295: 56), Engobe (pp. 295: 246), blow-gun (pp. 298: 79), pipe (pp. 298: 305). Since it was not possible for us to decide which is the correct and which the false statement, we have followed the table throughout. The trident is represented twice in the table with identical statements. Obviously, this is a simple mistake. It would be desirable if Métraux were to remedy this defect in the second edition of his valuable book.

all by the works of Graebner. Unfortunately, in Graebner's "Methode der Ethnologie" it is not specified in a desirable manner. Above all, it is not separated from the criterion of quantity.

The comparison of peoples, in order to recognize their relationship, has meaning only when it extends to a large number of traits, and possibly to the entire culture-inventory. In this sense the criterion of quantity should be specified: it has almost nothing to do with the assumption of historical relations. If two peoples are to be considered similar when they correspond in a large number of traits positively and negatively, then two culture elements are to be considered as diffused in the same way when they appear among the same peoples and also are lacking among them.

But when somewhat more extensive material is available then the purely technical question arises as to how these criteria are to be applied. It is almost impossible, in the comparison of peoples, to take into account simultaneously some hundreds of traits and, in the comparison of the culture elements, to comprehend their presence and absence among a hundred peoples. For the comparison of culture elements, the so-called cartographic method has been used up to the present. Whether or not two culture elements were similarly diffused was decided by observation of the distribution charts. Moreover, these charts were, for the most part, very defectively made. They showed, above all, only the presence but not the absence of an element. Where nothing was entered, it remained questionable whether the element was missing or only sufficient data. The charts of G. Tessman alone make a laudable exception in this regard. But even the best chart is an insufficient basis for ethnological work, especially because it does not show to us the distribution of elements among the ethnographical units, tribes and peoples, but only among ethnographically indifferent areas. If the cartographic procedure can be thus regarded only as a highly inadequate expedient of trait comparison, then, up to now no technical procedure whatever has been known. At first the starting point was from a small number of traits that could be easily surveyed. Such an inadmissible method naturally must have produced questionable results.

As the only way of getting out of these difficulties, we believe that the statistical method should be considered. This was introduced into ethnology in the year 1911 by J. Czekanowski[3] but up to the present it has not found a wide adoption. Like Czekanowski, we have applied the association coefficient Q in this work.

[3] Czekanowski, Objective Kriterien in der Ethnologie.

If, for instance, we want to establish the degree of similarity between pile work and mud masonry in regard to their diffusion among Tupi peoples, we must first of all take into account the presence and the absence of these elements.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Pile work	−	−	−	+	−	−	−	−	−	−	−	−	−	−	−	−	+
Mud masonry	−	+	+	+	+	−	+	−	−	−	−	−	+	−	−	−	−

In the vertical column both of the compared elements appear; in the horizontal column seventeen tribes of the Tupi group. We have now to establish: (a) how frequently pile work and mud masonry appear together, (b) how often mud masonry appears alone, (c) how often pile works appear alone, (d) how often both elements are absent. The four numbers obtained are arranged in the following manner:

	Pile work +	Pile work −
Mud masonry +	*a*	*b*
Mud masonry −	*c*	*d*

In our case the following number group results:

	Pile work +	Pile work −
Mud masonry +	1	5
Mud masonry −	1	10

From these numbers, we can calculate the association coefficient Q, e.g., by Yule's formula:

$$Q_2 = \frac{(ad - bc)}{(ad + bc)}$$

$$Q_2 = \frac{(10 - 5)}{(10 + 5)} = \frac{5}{15} = +0.33.$$

The computed coefficient fluctuates between +1.0 and −1.0. An absolute identity is indicated by +1.0; −1.0 is an absolute difference. Zero indicates that there exists neither a tendency toward similarity nor one of dissimilarity. The greater the positive coefficient, the greater the similarity.

But we have also the following:

		Bororo spindle	
		+	−
Pipe	+	1	3
	−	−	13

Thus Yule's formula gives:

$$Q_2 = \frac{13-0}{13+0} = +1.0$$

Since both elements appear three times separately, we cannot consider this coefficient as an adequate expression of actual conditions. Therefore it is recommended, in those cases where one of the four numbers is equal to zero, not to apply Yule's formula, but that of Pearson, as follows:

$$Q_6 = \sin\frac{\pi}{2}Q', \text{ wherein } Q' = \frac{ad-bc}{\sqrt{(a+b)(a+c)(d+b)(d+c)}}$$

In the case mentioned above, the following values result:

$$Q' = \frac{13}{832} = +0.451$$

$$Q_6 = \sin\left(\frac{\pi}{2} \times 0.451\right) = \sin 40^\circ\ 40'$$

In the logarithmic tables we find that $\sin 40^\circ\ 40' = 0.65$. Thus the coefficient is $+0.65$.

Coefficients Q_6 can then be regarded as a much closer approach to reality, although their calculation is a little more complicated than Q_2.

Just as the similarity of distribution of two traits can be determined with the help of the stated formulae, so also can that of the whole cultures of two peoples. Here we count (a) the traits that are common to both peoples, (b) those pertaining to only one, (c) those confined to the other; finally (d) those traits that are lacking among both peoples, but which appear within the district investigated. The use of these four numbers follows the method just described.

In order to comprehend the grouping of the traits representing whole cultures, we must compare each people with the other trait by trait. If we have, let us say, four peoples, Tupinamba, Guarani, Caingua, and

Chiriguano, who are characterized by 146 culture elements, we obtain, after calculation of Q_6, the following tabular arrangement.

	1	2	3	4
1 Tupinamba	+1.0	+0.86	+0.41	−0.18
2 Guarani	+0.86	+1.0	+0.63	+0.15
3 Caingua	+0.41	+0.63	+1.0	+0.50
4 Chiriguano	−0.18	+0.15	+0.50	+1.0

This table shows us that Tupinamba and Guarani are very closely connected. The Caingua join them with a somewhat smaller coefficient. The Chiriguano are, however, isolated. They show greatest relationship with the Caingua. We can make these conditions still more evident by a graphical representation introduced by J. Czekanowski.[4] We take the same coördinate-net as in the table and evaluate the coefficients in such a manner that we represent the values from +1.0 to +0.80 by black squares; those from +0.79 to +0.60 by squares with two strong black lines; those from +0.59 to +0.40 by squares with a thin line. Values from +0.39 to 0.0 and the negative values remain without a graphical equivalent. In our case, we obtain the following diagram (fig. 1). The close relationship of

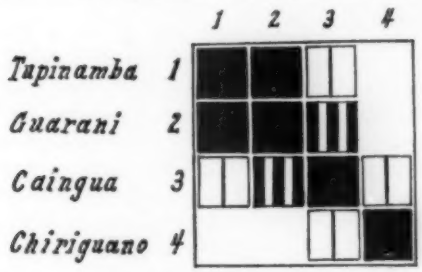


FIG. 1. Graphic representation of the coefficients of association (Q_6) between four tribes.

Tupinamba and Guarani and on the other hand the isolation of Chiriguano are expressed in it with exceptional sharpness.

Reference must be made to a noteworthy peculiarity of both Yule's and Pearson's coefficients. When we compare only two peoples with each other, we can establish which elements appear among both and which are peculiar only to one or the other people. It is, however, impossible to procure any elements which are lacking in both without lapsing into absolute arbitrari-

[4] Czekanowski, Zur Differentialdiagnose der Neandertalgruppe.

ness. The coefficient becomes then constantly negative. This can be considered as the analytical expression of the fact that the comparison of two isolated groups, without the presence of a *tertium comparationis*, does not lead to any result.

If we have distinguished on the one side groups of peoples and on the other groups of traits, we must place both of these groupings in relation to one another.

Only then can we explain our groupings historically. Culturally, very similar peoples will have stood, in general, in a historical relation to each other. On the other hand, one can assume from the uniformly distributed traits that their distribution has been determined by like factors. That means however, in the majority of cases, that the elements of a trait group must have spread together. The next task consists in determining the chronological sequence of various trait groups. According to our view, the various criteria of stratification can give here only indications and probabilities. A certain chronology is, however, possible only with the help of archaeology. We must then place our groups in relation to those of the neighboring territories. As to relations with distant areas, without doubt a prominent rôle falls to the continuity-criterion. It is clear that here again the help of archaeology is indispensable.

II

1. From the large number of Tupi peoples, Métraux has selected seventeen most representative and best known. These are in the order chosen by him: Tupinamba, Guarani, Caingua, Chiriguano, Guarayu, Yuruna, Chipaya, Ararandeuara, Tembe, Tapirape, Aueto, Apiaca, Munduruku, Mauhe, Parintintin, Omagua, and Oyampi. Of these seventeen tribes, he notes in a large chart the presence and absence of 146 culture elements. Since, among these as mentioned above, spear-thrower and trident are doubly represented, only 144 remain. We have added two more elements—square house and men's house—from the table in the text (p. 59), so that again there are altogether 146 elements.

Our first task consists in establishing the degree of similarity beween the seventeen Tupi tribes on the basis of these 146 elements. The calculation gives, on the basis of Pearson's formula, the following Table 1 and, as its graphical presentation, the diagram, Figure 2.

The first conspicuous result is the isolation of Chiriguano, in opposition to whom all other Tupi peoples form a closed group. The Chiriguano have either negative or very slight positive coefficients with other tribes, while elsewhere in the table there appear only positive coefficients, mostly of

TABLE 1. THE COEFFICIENTS OF SIMILARITY (Q_s) BETWEEN TUPI TRIBES

		Chiriquano	Caingua	Guarayu	Guarani	Tupinamba	Oyampi	Ararandeuara	Tembe	Yuruna	Chipaya	Mahue	Apiaca	Parintintin	Tapirape	Munduruku	Aueto	Omagua
		4	3	5	2	1	17	8	9	6	7	14	12	15	10	13	11	16
Chiriguano	4	+1.0	+.50	+.19	+.15	−.18	+.05	−.11	+.04	−.14	−.05	−.01	−.10	−.06	+.11	−.29	−.04	+.06
Caingua	3	+.50	+1.0	+.66	+.63	+.41	+.49	+.52	+.59	+.47	+.45	+.53	+.42	+.44	+.56	+.33	+.36	+.26
Guarayu	5	+.19	+.66	+1.0	+.69	+.61	+.65	+.65	+.61	+.60	+.61	+.66	+.59	+.72	+.63	+.56	+.51	+.26
Guarani	2	+.15	+.63	+.69	+1.0	+.86	+.43	+.55	+.53	+.61	+.64	+.53	+.48	+.45	+.59	+.44	+.36	+.44
Tupinamba	1	−.18	+.41	+.61	+.86	+1.0	+.68	+.63	+.54	+.69	+.74	+.70	+.58	+.68	+.53	+.63	+.45	+.40
Oyampi	17	+.05	+.49	+.65	+.43	+.68	+1.0	+.77	+.75	+.71	+.65	+.70	+.64	+.69	+.64	+.49	+.50	+.47
Ararandeuara	8	−.11	+.52	+.65	+.55	+.63	+.77	+1.0	+.89	+.83	+.78	+.91	+.79	+.73	+.78	+.58	+.54	+.43
Tembe	9	+.04	+.59	+.61	+.53	+.54	+.75	+.89	+1.0	+.79	+.84	+.77	+.77	+.72	+.66	+.5	+.50	+.38
Yuruna	6	−.14	+.47	+.60	+.61	+.69	+.71	+.83	+.79	+1.0	+.98	+.81	+.83	+.80	+.71	+.71	+.72	+.54
Chipaya	7	−.05	+.45	+.61	+.64	+.74	+.65	+.78	+.84	+.98	+1.0	+.92	+.86	+.83	+.70	+.81	+.65	+.62
Mahue	14	−.01	+.53	+.66	+.53	+.70	+.70	+.91	+.77	+.81	+.92	+1.0	+.89	+.80	+.82	+.79	+.56	+.39
Apiaca	12	−.10	+.42	+.59	+.48	+.58	+.64	+.79	+.77	+.83	+.86	+.89	+1.0	+.87	+.75	+.86	+.66	+.24
Parintintin	15	−.06	+.44	+.72	+.45	+.68	+.69	+.73	+.72	+.80	+.83	+.80	+.87	+1.0	+.78	+.69	+.58	+.24
Tapirape	10	+.11	+.56	+.63	+.59	+.53	+.64	+.78	+.66	+.71	+.70	+.82	+.75	+.78	+1.0	+.61	+.58	+.52
Munduruku	13	−.29	+.33	+.56	+.44	+.63	+.49	+.58	+.53	+.71	+.81	+.79	+.86	+.69	+.61	+1.0	+.54	+.19
Aueto	11	−.04	+.36	+.51	+.36	+.45	+.50	+.54	+.50	+.72	+.65	+.56	+.66	+.58	+.58	+.54	+1.0	+.24
Omagua	16	+.06	+.26	+.26	+.44	+.40	+.47	+.43	+.38	+.54	+.62	+.39	+.24	+.24	+.52	+.19	+.24	+1.0

considerable size. The gradation of positive coefficients allows us to undertake a further subdivision within the large group. The Caingua and Guarayu are relatively most closely related to the Chiriguano; otherwise both are comparatively isolated, although in a much smaller measure than Chiriguano. Then the Guarani and Tupinamba (group B) form a closed group. A large group (A) follows that includes not less than ten of our seventeen Tupi peoples. The center of this group (sub-group A_2) comprises Yuruna, Chipaya, Mauhe, Apiaca, Parintintin, and Tapirape. To them are

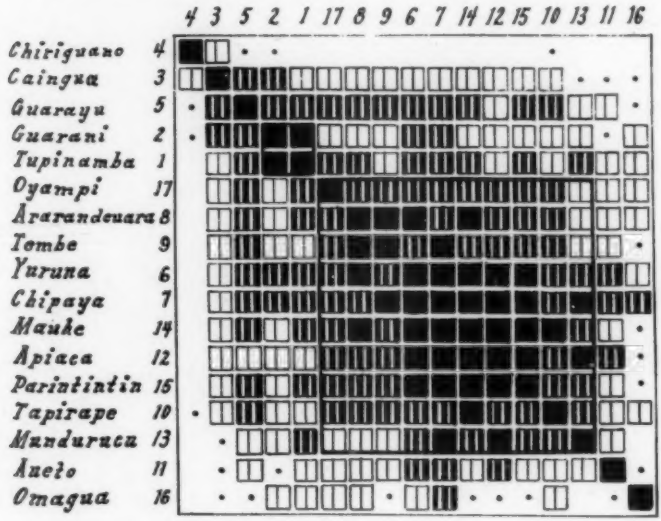


FIG. 2. Graphic representation of the coefficients of association (Q_6) between Tupi tribes.

joined on the one side the Tembe, Ararandeuara and Oyampi (sub-group A_1) and on the other, the Munduruku (A_3). Outside of group A, yet not without a certain affinity to it, are the Aueto. Again, the Omagua are strongly isolated; they approach most closely the upper part of group A. As a general result of the diagram we can establish an extensive cultural equation of all Tupi peoples with the exception of Chiriguano alone. This fact was already emphasized by Nordenskiöld and Métraux.

If we want to learn more fully which peoples within the Tupi family occupy a central and which a marginal position, the accompanying dia-

gram yields information (fig. 3). It is arranged in such manner that in the vertical columns are noted the six largest positive coefficients. Thus each vertical column shows us to what other tribes a people has relatively the greatest similarity; the horizontal, on the other hand, shows for what other tribes this people is among the most similar. As we see, all these tribes which have a great number of entries in their horizontal columns belong to the group A.

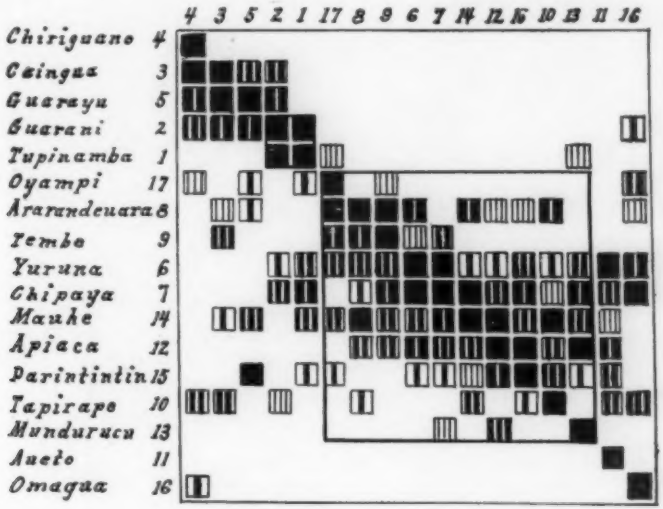


FIG. 3. Graphic representation of the six highest coefficients of association (Q_6) between Tupi tribes.

The grouping presented is in full conformity with the geographical distribution of the Tupi peoples, as the accompanying map shows (fig. 4). The southern basin of the Amazon is occupied by the peoples of group A_2. Scattered among them appear the Munduruku (A_3). On both sides of the mouth of the Amazon we find tribes of the group A_1. The Tupinamba of the Brazilian coast and the Guarani of the Parana region are united in group B. The Caingua,[5] Guarayu, and Chiriguano are also mostly isolated like the Aueto and the Omagua.

[5] The Caingua appear on the charts of P. W. Schmidt, W. Krickeberg, and A. Métraux marked in quite different places. It would be welcome if competent authors were to agree on that point some day.

2. We have now to consider the question: what is the reason for just such a grouping of tribes? To answer this question we must investigate the grouping of the elements according to their distribution among Tupi peoples.[6] The result of the calculation of culture elements with the help of Pearson's formula appears in the accompanying diagram (fig. 5).

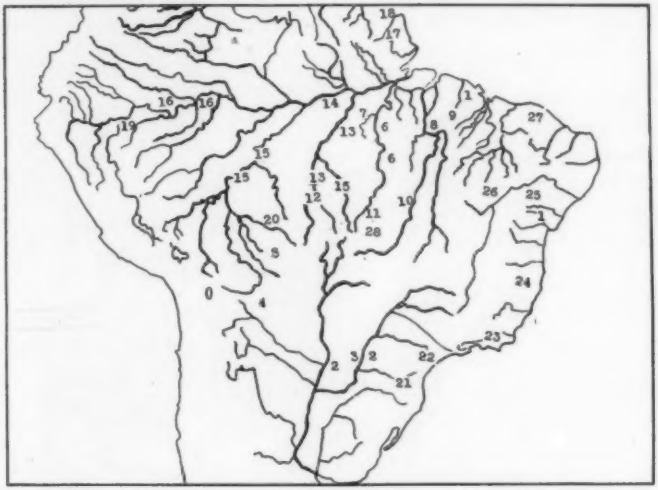
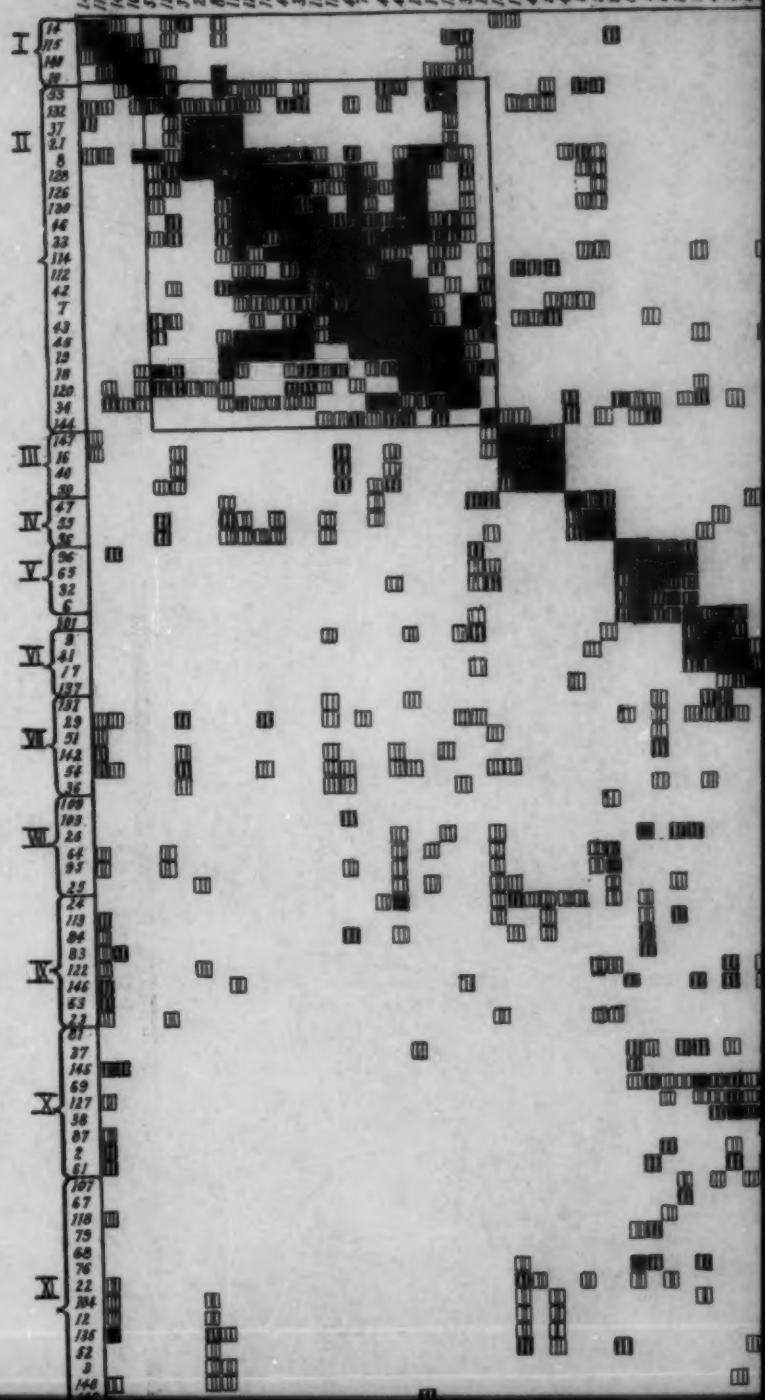


FIG. 4. Distribution of the more important Tupi tribes. (After A. Métraux, W. Krickeberg, and W. Schmidt.)

1. Tupinamba
2. Guarani
3. Caingua
4. Chiriguano
5. Guarayu
6. Yuruna
7. Chipaya
8. Araranđeuara
9. Tembe
10. Tapirape
11. Aueto
12. Apiaca
13. Munduruku
14. Mauha
15. Parintintin
16. Omagua
17. Oyampi
18. Emerillon
19. Cocama
20. Pauserna
21. Cario
22. Tupi
23. Tamoya
24. Tupiniquin
25. Tupina
26. Amoipira
27. Potiguara
28. Kamayura

[6] We have enumerated the elements on the basis of their order in Métraux's table, to which we add square house (147) and men's house (148). The following elements have an identical distribution (in the diagram sometimes only the first appears): 51 and 27; 109, 102, 66; 64 and 94; 23 and 49; 87, 88, 86, 85, 78, 75, 74, 73, 71, 70, 62, 60; 59, 68, 98; 12, 58; 108, 100, 99; 20; 91, 166, 139; 77, 79.


I
II
III
IV
V
VI
VII
VIII
IX
X
XI

V
65
32
6
VI
41
17
VII
29
50
142
54
36
VIII
193
26
64
95
25
IX
113
84
83
122
146
63
X
37
145
69
127
38
87
2
61
XI
67
118
73
68
76
22
104
12
135
52
3
148
143
XII
20
13
XIII
126
116
141
XIV
179
28
9
48
XV
93
30
106
105
138
132
90
177
1
11
111
131
86

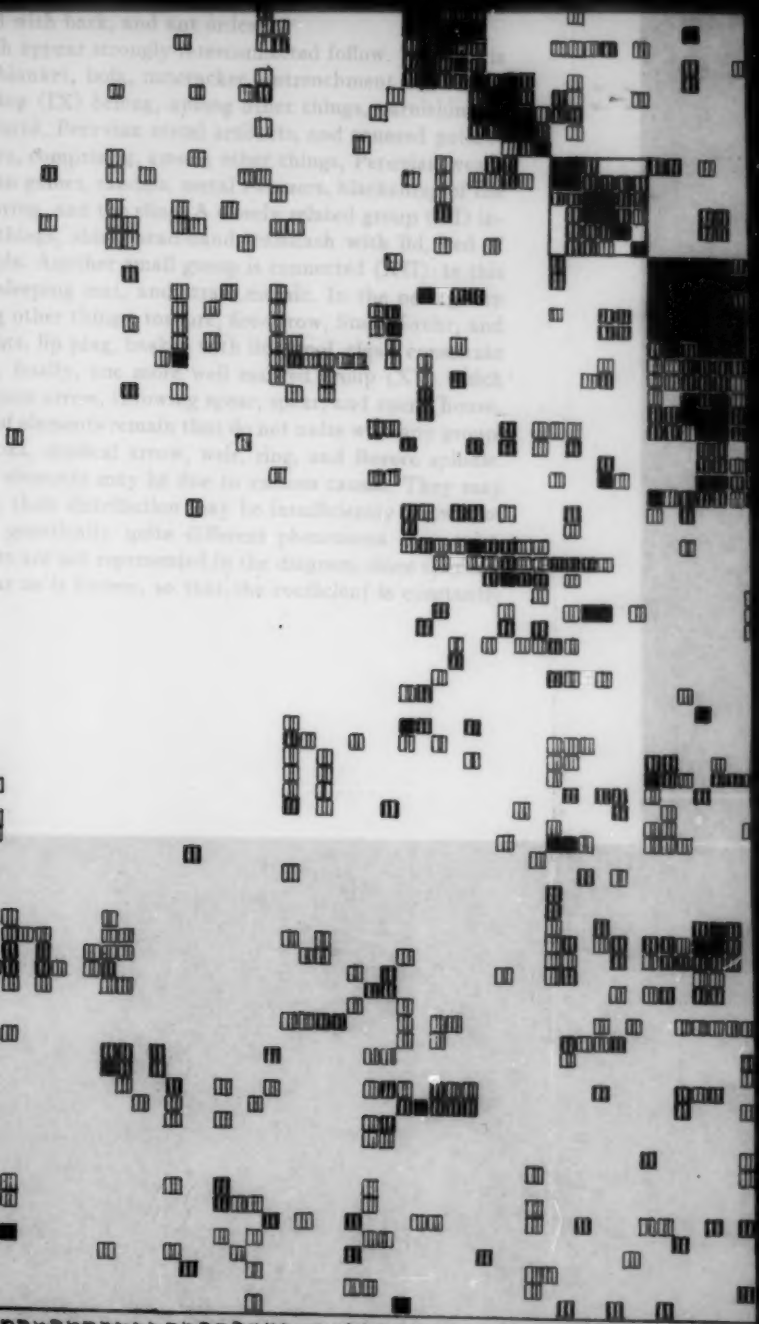


FIG. 5. Graphic representation of the coefficients of

raphic representation of the coefficients of association (Q_s) between the distribution of elements.

nents.

This diagram proves that we have to do with different trait groups. On the other hand, the prevalence of positive coefficients is another indication of extensive agreement in the cultural possessions of the Tupi peoples. Let us follow the various trait groups in order. A small group (I) at the upper left of the diagram consists, among other things, of fire-drill, dagger, and Arara methods of affixing feathers to arrows; thereon joins a large group (II) to which belong penis sheath, feathering of east Brazilian type, bow with convex-plain cross-section, digging stick, smoking grate, fire implement with incision, dug-out canoe, bitter manioc, manioc basket, manioc-grater, punt poles, skin canoe, earplug, and Pan-pipe. Two other smaller groups follow. The first (III) contains square houses, fish poisoning, tattooing, and Urupe; the second (IV) contains, among other things, feather cap and feather coat.

A sharply defined group (V) is formed among other things, of nose-piercing, feather fans, head deformation, signal drums of wood, secondary burial in urns, wickerwork of Ucayali type. The next group (VI) is characterized by feathering of Xingu type, sieve net, and conical club. In the following (VII) we find, among other things, bow with round cross-section, clay for pottery mixed with bark, and ant ordeal.

Seven groups which appear strongly interconnected follow. The first is characterized by fur blanket, bola, nutcracker, entrenchment and shield (VIII). To the following (IX) belong, among other things, varnishing of pottery, direct burial urns, Peruvian metal artifacts, and squared pots. A large group (X) follows, comprising, among other things, Peruvian weaving technique, Peruvian games, sandals, metal tweezers, blackening of the teeth, Peruvian feathering, and the sling. A closely related group (XI) includes, among other things, shirt, head-band, calabash with lid, bed of fur, and arrow for birds. Another small group is connected (XII): to this belong cooking sack, sleeping mat, and straw mosaic. In the next group (XIII) we find, among other things, tonsure, fire-arrow, Stampf-rohr, and pole club. Four elements, lip plug, basket with lid, stool, cigar, constitute group XIV. We have, finally, one more well marked group (XV) which contains blow-gun, poison arrow, throwing spear, spear, and round house.

Finally, a number of elements remain that do not unite with any group. These are apron, maloka, musical arrow, weir, ring, and Bororo spindle. The isolation of these elements may be due to various causes. They may really be independent; their distribution may be insufficiently known; or finally a confusion of genetically quite different phenomena may exist. Further, seven elements are not represented in the diagram, since they appear everywhere, so far as is known, so that the coefficient is constantly

TABLE 2. DISTRIBUTION OF ELEMENTS

		Chirigano 4	Caingua 3	Guaraya 5	Guarani 2	Tupinamba 1	Gyampi 17	Arawakoara 8	Tembe 9	Turuna 6	Chipaya 7	Aymara 14	Apiaca 12	Puriatatin 15	Tapirape 10	Mundurucu 13	Aweto 11	Omagua 16	
	14	+		+	-	+	+							+					Multipointed arrow
I	115			+		+								+					Perforated fire-drill
	140													+					Dagger
	10												+	+					Arara feathering
	53				+	+					+	+	+	+		+			Penis sheath (section
	132			+		+	+	+		+		+	+	+	+		+		Bow with plano-convex cross-
	37	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	Basket of single palm leaf
	21	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Spindle with bulge
	8			+	+	+	+	+		+	+	+	+	+	+	+	+	+	Feathering of E. Brazil type
	128			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Head ornament of feathers
	126			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Maraca
	130			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Digging stick
	46			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	But for inhaling tobacco
II	35			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Cradle hood (smoke
	114			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Fire-drill with lateral
	112			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Dug-out canoe (incision
	42			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Manioc grater
	7			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Bitter manioc
	43				+	+	+	+	+	+	+	+	+	+	+	+	+	+	Tipiti
	45			+		+	+	+	+	+	+	+	+	+	+	+	+	+	Plate for manioc
	19			+		+	+	+	+	+	+	+	+	+	+	+	+	+	Crutch paddle
	18				+	+	+		+	+	+	+	+	+	+	+	+	+	Boat of bark slabs
	120			+		+	+	+		+	+	+	+	+	+	+	+	+	Ear sticks
	34			+		+		+	+	+	+	+	+	+	+	+	+	+	Pan pipe
	144				+	+	+		+	+								+	Harpoon
	147	+	+	+	+	+	+	+	+	+	+			+	+			+	Squared house
	16	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Fish poisoning
III	40	+	+	+	+	+	+	+	+	-	-	-	+	+	+	+	-	-	Urupe
	50	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	-	-	Tattooing
	47									+	+								Storage crib
IV	55				-	+				+	+	+					+	+	Feather cap
	56				+	+				+	+	-					+	+	Feather mantle
		4	3	5	2	1	17	8	9	6	7	14	12	15	10	13	11	16	

		Chirigano 4	Caingua 3	Guaraya 5	Guarani 2	Tupinamba 1	Gyampi 17	Arawakoara 8	Tembe 9	Turuna 6	Chipaya 7	Aymara 14	Apiaca 12	Puriatatin 15	Tapirape 10	Mundurucu 13	Aweto 11	Omagua 16	
	96				+													+	Nose piercing
	65																	+	Feather fan
	72																	+	Head deformation
V	69																	+	Signal drum of wood
	97																	+	Wicker-work of Ucayali type
	32								+									+	Secondary burial in urns
	6															+		+	Turtle shell fence
	101																+	+	Spear thrower
	9								+									+	Feathering of Xingu type
	41																	+	Sieve net
VI	17											+						+	Cayubaba basket for fishing
	137	+										+	+	+		+		+	Conical club
	131		+		+		+											+	Bow with round cross-section
	29		+	+	+	+	+											+	Guarayu carrying basket
	51						+												Stamp (pottery making
VII	27						+												Bark mixed with clay for
	142					+	+												Poisonous plants smoked
	54			+	-	+	+			+									Body ornament of feathers
	36					+	+	+	+	+	+								Ant ordeal
	109				+														Blanket of fur
	102				+														Bola
	66				+														Pounding slab
	103				+	+													Nut-cracker
VIII	28				+	+													Engobe
	64				+	+													Fishing hook
	94				+	+													Shield
	95				+	+													Entrenchment
	25				+	+													Finger impression ornament
	24	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	Varnishing of pottery
	113	+			+	+	+									+		+	Raft
	84	+	+		+	+												+	Direct burial in urns
	83	+			+	+												+	Peruvian artifacts of metal
IX	122	+			+	+											+		Shell necklace
	146	+		+	+									+		+	+	+	Cord
	63	+			+														Snare
	23				+														Squared pots
	49				+														Calf deformation
		4	3	5	2	1	17	8	9	6	7	14	12	15	10	13	11	16	

TABLE 2. DISTRIBUTION OF ELEMENTS (CONT'D)

		Chiriguano	Chingua	Cherente	Guarayu	Tupinamba	Oyampi	Arawaknoans	Tembe	Yuruna	Chipaya	Mauhe	Apiaca	Parintintin	Tapirape	Mundurucu	Aweto	Omagua	
		4	3	5	2	1	17	8	9	6	7	14	12	15	10	13	11	16	
	81	+			+														Pots with handles
	82	+			+														Pots with perforation for
	31	+		+	+												+	+	Caoutchouc (carrying
	145	+		+															Trident
	69	+															+	+	Sewed calabash
	127	+					+										+		Dance mask
	38	+															+		Maize leaf ball
	87	+																	Taya
	88	+																	Wicker-work of Peru type
	86	+																	Chuncareta game
X	85	+																	Chunquanti game
	78	+																	Sandal
	75	+																	Wooden comb
	74	+																	Metal tweezers
	73	+																	Black dye for teeth
	71	+																	Wooden platter
	70	+																	Spoon
	62	+																	Sling
	60	+																	Spade
	2	+					+												Pile dwellings
	61	+												·	·		·		Feathering of Peru type
	107	+	+														+		Tump-line
	67	+	+													+			Pyrography
	118	+	+				+												Calembe
	79	+	+														+		Head band
	77	+	+														+		Woven belt
	59	+	+																Catre
	68	+	+																Calabash with lid
	90	+	+																Fur bedding
	76	+	+	+													+		Shirt
XI	22	+	+	+	+		+		+	+				·			·		Loom of Aruak type
	104	+	+	+	+														Pipe
	12	+	+		+	+													"Lac fixé à un bâton"
	36	+	+		+	+													Skin drum
	135	+	+	+	+	+	·												Bird arrow
	52	+	+	+	+			+	+										Tipoy
	3	+	+	+	+					+							+		Clay walls
	148	+	+	+	+		+										+	+	Men's house
	143	+	+					+									+		Wristlet
	125	+	+				+		+								·		Feather head dress tuft
		4	3	5	2	1	17	8	9	6	7	14	12	15	10	13	11	16	

		Chiriguano	Chingua	Cherente	Guarayu	Tupinamba	Oyampi	Arawaknoans	Tembe	Yuruna	Chipaya	Mauhe	Apiaca	Parintintin	Tapirape	Mundurucu	Aweto	Omagua	
		4	3	5	2	1	17	8	9	6	7	14	12	15	10	13	11	16	
	108		+																Cooking sack
	100		+																Arrow feathering triple
XII	99		+																Sleeping mat
	20		+																Triangular pendant
	13		+		·	+													Mosaic of straw
	35		+	+	+	+													Bull-roarer
	138		+	+	+	+	·								·		+	·	Club (Mocoaa type)
XIII	116		+	·	+	·											+	+	Tomeure
	141				+	+	+					+					+		Fire arrow (section
	134	+		+							+								Bow with squared cross-
	119	+	+	+	+	+	+	+				+			+		+		Lip stick (Tembeta)
	28	+	·	+	·	+	·	+		·					+	·	·	·	Basket with lid
XIV	5	+	+	+	+	+	+	·	+	+	+	+	·	·	·		+	+	Stool
	48	+	+	+	+	+	+	+			+	+	+	+			+	·	Cigar
	57					+	+										+	+	Discoloration of feathers on
	95																+	+	Blow-pipe (live birds
	30					+	·	+									+		Lattice-work basketry
	91																+		Arrow poisoning
XV	106																+		Coiled basketry
	139																+		Spear
	105	+															+		Brooch
	136	+														+	+	·	Lance
	133														+	+	+		Bow with convex-plane cross-
	80														+	+	+	+	Round house (section
	117	+	+		+							+	+					+	Apron
	1	+	+	+	+	+	+				+	·	+	·	+	+	+	+	Maloka
	11										+		+						Whistling arrow
	111	+	+	+	+		·	·	·	·	·	·	+	·	·	·	·	·	Weir
	121	+											+	+					Finger ring
	80			+															Spindle of Bororo type
	4	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Hammock
	129	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Cotton
	39	+	+	+	·	+	+	+	+	+	+	+	+	+	+	+	+	+	Palm fan
	44	+	+	+	+	+	+	+	+	+	+	·	+	+	+	+	+	+	Wooden mortar
	110	+	+	+	+	+	+	·	+	+	+	+	+	+	+	+	+	+	Streams choked for fishing
	123	+	+	+	+	+	·	+	+	+	+	+	+	+	+	+	+	+	Spindle of Bakairi type
	124	+	·	+	·	+	+	·	·	·	+	·	+	·	+	·	+	+	Head trophy
		4	3	5	2	1	17	8	9	6	7	14	12	15	10	13	11	16	

indefinite. These are hammocks, wooden mortars, streams choked for fishing, spindle of Bakairi type.

3. Now we can prepare a table showing both peoples and culture elements in the order established by calculation (table 2). This table allows us to make decisions concerning the distribution and character of individual trait groups. Group I is characterized by its appearance among Parintintin. Group II is well represented among all Tupi peoples with the single exception of Chiriguano. Group III has a similar distribution, but it is also present among Chiriguano and absent among Aueto. Group IV is represented primarily among Chipaya and Yuruna; further among Tupinamba, Munduruku, and Aueto. In our first four groups we have to do with elements of that horticultural complex which Krickeberg[7] designated as characteristic of tropical South America. This culture is represented with special intensity in the Amazon basin. Therefore groups I-IV can be combined as Amazonian.

The fifth group appears almost wholly confined to the Omagua. It contains not a few elements of the Ecuador civilization. The sixth group appears primarily among Aueto. In all probability we have to deal here with the equivalent of one of those acculturation processes in the Xingu headwaters which K. v. d. Steinen[8] has described. We therefore believe that we might call this the Xingu group. The seventh group appears mainly among Oyampi. We might see in it the result of culture exchanges with the Guiana peoples and call it, accordingly, the Guiana group. The elements of group VIII are peculiar to Guarani alone, in part, and in part to Guarani and Tupinamba. Among those to be found only among Guarani are such elements as undoubtedly go back to the culture of Pampas peoples. And they were not present among all Guarani, but only among Guaranized Cario.[9] The elements common to Tupinamba and Guarani are puzzling as to origin. Thus the shield appears again in greater intensity only in the Orinoco region. We find the ninth group among Chiriguano, Guarani, Tupinamba, and partly among the Omagua. It consists, for the most part, of elements of the Peruvian civilization, which, through trade relations have spread as far as the Brazilian coast. Group X is mostly limited to the Chiriguano.

[7] Krickeberg, Amerika.

[8] von den Steinen, Unter den Naturvölkern Zentral-Brasiliens.

[9] Once more it should be emphasized that the results of the analysis depend, of course, completely on the reliability of the material taken as the basis; in our case, on the reliability of Métraux's table. Since we are not convinced of its reliability in all points and above all have many an objection to his typology, we prefer to see the value of this paper less in its concrete results than in the demonstration of the advantages of the statistical methods for ethnological work.

We can say with certainty that this is a case of a quite recent influence, mostly from the Peruvian high-culture. The eleventh group appears among Chiriguano and Caingua, further among Guarani and Guarayu. We are dealing here, most probably, with a younger component of the mixed culture of the Gran Chaco, into which not a few Peruvian elements intruded.

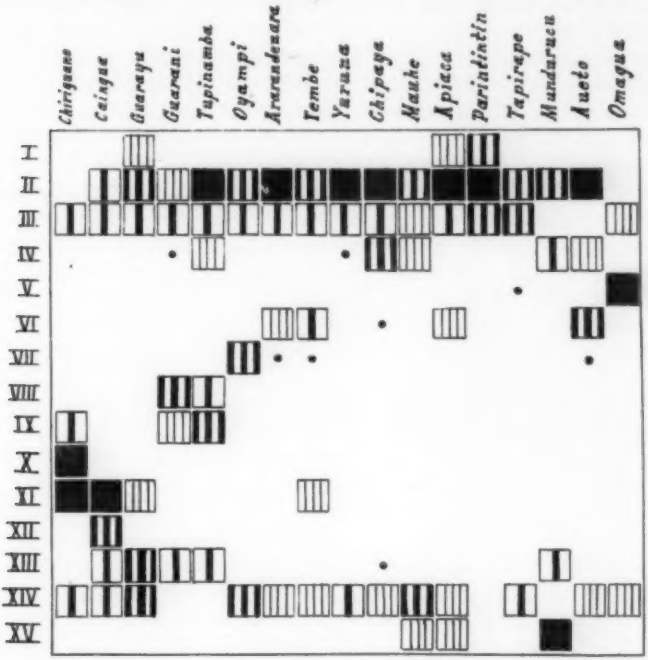


FIG. 6. Graphic representation of the coefficients of association (Q_s) between particular tribes and groups of elements.

Our group XII is limited to Caingua. There is no doubt that the case here is one of influence from the primitive culture of the east Brazilian high land. Group XIII is lacking among Chiriguano; it is, however, present among Caingua, Guarayu, Guarani, and Tupinamba. Most probably we have to do here with an older component of Chaco culture. Group XIV shows a relation to our first four groups: it is characterized by its absence among the Parintintin. Group XV is rather exclusively limited to the

Munduruku. Its elements are represented, above all, in northwest Brazil.

4. In order to make the structure of the culture of particular peoples more conspicuous, we have established statistically the affinity between peoples and trait groups. We count how many elements of individual trait groups an individual people has (table 3). To the numbers so obtained the Pearson's formula can then be applied: the accompanying diagram is the result (fig. 6).

We see that the isolation of the Chiriguano is caused by the fact that they have a strong affinity with the recent Peruvian group (X) and also one quite as considerable with the younger Chaco group (XI). The special situation of the Caingua is explained by its great affinity with the younger Chaco group and with group XII, which we consider as derived from the primitive culture of east Brazil. The cultural structure of Caingua is very complicated, since the Amazonian and both the Chaco groups are represented by positive but insignificant coefficients. For the Guarani group

TABLE 3. THE NUMBER OF ELEMENTS IN EACH GROUP IN THE INVENTORIES OF PARTICULAR TRIBES

	Chiriguano	Caingua	Guarayu	Guarani	Tupinamba	Oyampi	Ararandeuara	Tembe	Yuruna	Chipaya	Mauhe	Apiaca	Parintintin	Tapirape	Munduruku	Aueto	Omagua	
	4	3	5	2	1	17	8	9	6	7	14	12	15	10	13	11	16	
I	1		2		1	1						1	4					4
II	2	10	13	8	19	13	11	8	16	14	9	13	15	7	13	14	6	20
III	4	4	4	4	4	4	2	2	3	3	1	2	4	3	1		2	5
IV				1	2				3	3	1				2	2		3
V			1			1								1			7	7
VI	1						1	2		1		1				4		4
VII		1	2	1	2	7	1	1			1					2		7
VIII				9	4									1			1	9
IX	7	1	1	5	9	1				1				1		2	4	9
X	21		2	3		2										4	2	21
XI	19	19	7	6	3	4	1	3	1	1				1	3	2	3	19
XII		5			1													5
XIII		3	4	3	4					1					3	1		4
XIV	4	3	4	3	3	4	2	1	2	2	3	1		2	1	2	2	4
XV	2				1						2	3			10	1	2	10
	61	46	40	43	53	37	18	17	25	26	17	21	23	16	33	34	29	131

VIII is characteristic, beside group IX, which for its part is significant for the Tupinamba.

The Oyampi are distinguished by a high coefficient with the Guiana group (VII). And again the culture of Ararandeuara is very mixed and without a definite characteristic component. Here both the Amazonian and Xingu (VI) are involved, as well as the Guiana groups. The case is similar for the Tembe, only here a much higher coefficient with the Xingu group is conspicuous. The culture of the Yuruna and the Chipaya appears almost exclusively determined by the Amazonian groups. The Apiaca and Mauhe show in addition a stronger northwest Brazilian group (XV) intrusion. Parintintin culture is fixed by groups I–III: Tapirape shows in addition to Amazonian affinities others to group VIII and to the northwest Brazilian group. The culture of the Aueto is predominantly characterized by the Xingu group and that of Omagua, above all, by group V.

5. The statistical analysis has set us in a position to distinguish the groups of peoples and the groups of elements, and to explain that the specific culture of particular peoples results from the combination of different groups of elements. Only now, having arranged the ethnographical material, can we proceed to an historical explanation. Above all, we must try to establish the chronological position of the various trait groups in the culture history of the Tupi peoples. Had the other large groups of peoples of tropical South America, such as the Arawaks, Carib, and Gêz, already been the subject of such an analysis as we are attempting here, then it would be easy to establish a connection between their trait groups and ours. Since unfortunately such investigations do not exist, we are limited mostly to suppositions.

Considering both their universal distribution and the primary position they take in the economic life of the Tupi, groups II, III and XIV must be considered as the most ancient stratum of the Tupi culture. The separation of this stratum into three different groups is due to the fact that some elements of this ancient stratum became lost among certain peoples. Also we must credit the seven universal elements to the original Tupi culture.

Thus Tupi peoples were originally endowed with the plant culture of the Amazon basin. This has been preserved not only among the peoples of the southern Amazon basin but also among the Tupinamba of the eastern coast, and there in large measure. The distinctness of the eastern and southern Tupi rests, then, not upon a different initial culture, but upon influences which can be proven secondary in time and function.

We are, therefore, forced to assign the original home of the Tupi to the

Amazon basin. Whether it was situated indeed, as Métraux assumes, between Madeira and Xingu, or north of the Amazon, is for the present not possible to discern.

The ancient cultural structure of tribes which are unified in the group A_2 has been modified in very small degree. Group III, very puzzling in its distribution, has only inconsiderably enriched the inventory of the Yuruna and Chipaya. On the other hand, the Parintintin, probably under the influence of their neighbors of the opposite side of the Madeira (the Carib Arara) have lost group XIV and substituted for it group I. Since the Parintintin have occupied their present home (according to the investigation of Nimuendajú) only in the nineteenth century, due to Munduruku expansion, it seems that here is a case of quite recent development.

Otherwise, particular elements of most varied groups are spread erratically among the central Tupi. The proximity of the Munduruku makes itself felt in some traits of group XV among the Apiaca and Mauhe.

Also the cultures of the Tembe and Ararandeuara, who adjoin the central Tupi on the east, have not experienced any specific decline. The original Tupi culture is somewhat more strongly leveled, and we might ascribe some new scattered acquisitions to their Arawak and Carib neighbors. The cultural destinies of Oyampi also seem not to have been revolutionized to any extent until they migrated in the seventeenth century from the region of the mouth of the Amazon to their present territory. Group VII represents the results of this new cultural environment. When, then, some elements of group XI appear among the Oyampi, we might explain this fact through the Arawak component of Chaco culture, coming from Chané.

The Tapirape appeared in the Araguaya region only in the seventeenth century from the region of Rio de Janeiro, according to a tradition mentioned by Métraux. Despite an element of group VIII, this report cannot be supported on the basis of their culture. The Tapirape have apparently lost relatively much of group II. Otherwise they connect completely with the central group.

The character of group XV makes it appear, without any doubt, that the Munduruku lived at some time in the neighborhood of the northwest Brazilian peoples. Since closer Arawak and Carib relations are apparently lacking, this stay might be set in a zone beyond the Carib-Arawak belt, opposite to that of the Tupi. When, then, the Munduruku burst into their present seat in the nineteenth century, they carried foreign elements from their surrounding peoples into the midst of an archaic Tupi culture.

The Aueto have been subject to the acculturation process in the upper

Xingu region; they have lost group III and exchanged for it group VI. The appearance of some elements of groups IX and X among the Aueto points to the fact that at least one of the isolated peoples inhabiting the Xingu source region show relations to the younger component of Chaco culture. Since the small group IV also appears among Aueto and places them in a closer relation with Yuruna and Chipaya, they might have lived in the vicinity of these tribes before their separation, although not very early.

The Omagua, already at the beginning of the sixteenth century living in the region of the mouth of Rio Napo, have migrated along the upper course of the Amazon into the area of the culture of northeastern Peru, by which ancient and high-culture elements have associated in a complicated manner. This explains the far-reaching loss of the original Tupi culture and exchange of group V. Since the Andean component, active here, is noticeable also in the Chaco, the appearance of some elements of groups IX and X among the Omagua is intelligible. However, it is of course inadmissible to place the home of the eastern Tupi (if not of all Tupi tribes) on the upper course of the Amazon for the sake of this partial correspondence, as W. Schmidt has done.

The question of the fate of the eastern and southern Tupi is the most difficult we have to answer. The conditions are extremely complex: this is already shown in the considerable number of trait groups involved. It is, therefore, to be regretted that Métraux did not include in his table more of the peoples of the Brazilian east coast, and, above all, that he takes the Guarani as one unit despite their cultural differences. Due to this, statistical analysis here labors under an especially great factor of uncertainty and the following reconstruction of the culture historical course can be of value only as an experiment.

First, one more word about the late, historically certain movements of the peoples concerned. The expansion of the eastern Tupi to the Brazilian coast is rather late, falling mostly in the fifteenth century. They pressed in a northeasterly direction, primarily down the valley of Rio San Francisco in all probability. That the starting point of this movement lay, therefore, on the highland between the Parana and Paraguay is in no way proven and for cultural reasons improbable. Rather, the common center of expansion of the eastern and southern Tupi might have been situated north of the given territory.

The eastern and southern Tupi may have taken over group XIII before their separation. The next phase seems to represent the acquisition of group IX by the Guarani (together with the Chiriguano) and Tupi-

namba. The Guarayu and Caingua took no part in this development: they had already separated from the rest of the southern Tupi. Perhaps by that time the Caingua had entered into relations with the Gêz peoples east of Parana and acquired group XII.

As the next stage we have to consider the split of the Chiriguano from the Guarani and their migration to the northwest.[10] Perhaps only after this process the acquisition of group VIII by the Tupinamba and Guarani followed. But since the cultural unity of Guarani and the homogeneity of group VIII are quite doubtful, this conclusion may be mistaken.

The Chiriguano arrived by rapid movements as far as the foot of the Andes. Here they fell in the path of the Peruvianized Chané. Under this influence, they lost groups II (and thereby the largest part of the original Tupi culture) and XIII and enriched their inventory by groups X and XI.

It is noteworthy that group XI is completely represented also among the Caingua, since this people, as far as we know, never lived west of Paraguay. In what way this group reached the Caingua and whether this, too, happened only in post-Spanish times, is hard to prove, but the latter circumstance is indeed probable.

Approximately contemporary with the Chiriguano, the Guarayu too moved from the Parana region toward the northwest. Since the cultural environment into which they came was in less strong contrast to their own culture and above all were rather untouched by late Andean influences, the cultural possessions of the Guarayu were not changed substantially. Among the scattered acquisitions from various groups, several elements of group XI represent the most important increase.

In conclusion we can establish:

1. The culture history of the Tupi peoples represents the secondary differentiation of an originally uniform people.

2. This differentiation took place by reason of the influence of peoples of foreign culture upon the particular tribes of the Tupi group and is a consequence of the most far-reaching expansion of the Tupi.

3. With each of the separated trait groups (except group IV) can be connected a group of foreign peoples responsible for the gain or loss of the particular trait group.

4. The fact that in the cultures of these foreign populations partly identical components are present is also responsible for the appearance of elements of a definite trait group, among peoples upon whom the population responsible for this trait group has not exerted a direct influence.

[10] This happened, as is known, only toward the beginning of the sixteenth century.

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LIFE HISTORIES RECORDED IN SKELETONS

By WILTON MARION KROGMAN

THE archaeologist and the physical anthropologist are more and more looking to one another for aid. The responsibility for the excavation of skeletal material does not fall upon either—it belongs to both. In a sense, however, the physical anthropologist is the more dependent: he must rely upon the skill and completeness of the technique of the archaeologist. Especially is he dependent that *all* skeletal material, no matter how incomplete or fragmentary, be sent to him, in as good condition—and here care in exhumation, preservation, *and* packing is implied—as possible under the varying circumstances of field work.

In February, 1933, the Anatomical Laboratory received from Mr H. O. Bowman, Columbia, Missouri, the skeletons of two children exhumed by Mr Bowman and a friend from an "Indian mound" near Hartsburg, Missouri. In his letter of communication Mr Bowman stated:

> . . . With the skeletons, however, were some fairly old wrought iron nails with fragments of wood still attached to them, and lying in positions which strongly suggested coffins. We came to the conclusion that some early settlers had made the same mistake we had, that is, they had taken the "mound" for an Indian burial mound and had placed the bodies in it so that they would not be disturbed. . . .

When the skeletons were unpacked and assembled they were found to be almost complete, with the exception of several of the smaller hand and foot bones and some of the epiphyses of the long bones. The completeness of these very young skeletons is a tribute to the care with which the exhumation was done, and lends credence to the interpretation of burial in a "coffin."

The problem of the racial identification of the remains is at first glance the main and only one: were these Indian children buried in accordance with the White man's custom; or were these White children—the children of early settlers or of emigrants on their way to the West—buried in either an "Indian mound" or a natural mounded eminence?

The question of the type of burial place is a difficult one, judging from photographs alone. The Indians often built burial mounds on natural eminences, merely "capping" an existing structure. Or, again, as in the glacial kame burials of Ohio, they utilized natural glacial mounds for intrusive burials. To come directly to the point, I do not think the burial place of the two skeletons was an artificial mound. This conclusion is based solely on the photograph of the burial site, which shows a low conical eminence of very large base diameter. I have no evidence from Mr Bowman of in-

trusion, but this may have been overlooked by the excavators. On the other hand there were no artifacts of Indian make associated with the burials, nor is there any record, as far as I know, of Indian artifacts being found in the "mound." Finally, the presence of iron nails and a "coffin" are certainly evidence of a post-European burial date, and are presumptive evidence of a White burial. This statement does not neglect the fact that Indians did build mounds during the historic period, or that they are known to have made intrusive coffin-burials in mounds already present. But unless there is direct and positive evidence to the contrary, it seems to me that the logical inference is the wisest one: that these children are historic and are White.

This conclusion is supported by a study of the skull of Skeleton A, the older and larger of the two. This skull is complete, except for the left nasal bone. It was received in about thirty pieces and has been admirably restored by Mr W. H. Sassaman, a Research Fellow in the Anatomical Laboratory. His skill and patience enables accurate measurements on the restored skull. The skull of the smaller child was so badly warped and broken, and so incomplete, that reconstruction and measurements were impossible.

The measurements of Skull A are as follows:

Cranial		*Facial*		*Indexes*	
	mm.		mm.		
Max. length	157.0	Bi-zygomatic	94.0	Cephalic	82.5
Max. breadth	129.5	Bi-gonial	67.0	Nasal	54.1
Auric. height	101.0	Total face height	83.5	Orbital	95.3
Min. frontal	79.5	Upper face height	49.5		
		Interorbital width	16.5		
		Nasal breadth	20.0		
		Nasal height	37.0		
		Orbital breadth	32.0		
		Orbital height	30.5		

The foregoing measurements are non-committal, for we do not know enough about racial distinctions in the skull of the child—if, indeed, that there are distinctions so early. The dimensions and the indexes certainly do not absolutely discriminate either White or Indian. The general appearance of the skull is that of a child of about four years: prominent parietal eminences, forehead slightly protuberant, face small compared to cranium, and orbital and nasal apertures relatively large compared to facial skeleton. The least forehead diameter and the bi-zygomatic width are both quite narrow and hence, by inference, non-Indian. The skull is crypto-

zygous, a condition which is certainly due to lack of bi-zygomatic development of face as a result of the process of growth.

Granted that racial craniology in the child is little known, and that racial characters may not appear until later, I venture the conclusion that the skull of Skeleton A is that of a male (?) White child. It is entirely probable, therefore, that Skeleton B—the smaller and younger—is White also, since the two were found buried rather close together. The two children may have been from the same family: brothers, or brother and sister.

In this report I have now proceeded about as far as the usual discussion of random skeletal material found while hunting for "Indian relics." Indeed, all too often associated skeletal material is carelessly thrown to one side and never made available for study. The reports that are made offer a few notes on measurements and a general assessment of age based on tooth eruption.

There is an obvious need for a more thorough and more detailed method of attack. The material offers itself for study and analysis, but to date accurate method has not replaced more or less casual observation. There must be a series of "checks" upon estimates of age, sex, and stock.

Recent studies at the Anatomical Laboratory and Associated Foundations have demonstrated the possibility of an age assessment based on teeth, cranio-facial growth, bone growth, and skeletal maturation in terms of epiphyseal ossification and union. Even more than that, the bones, studied under the X-ray, yield intrinsic evidence of the health vicissitudes of childhood. We may unfold, step by step, the health progress of the child.

We shall now turn our attention to the several detailed studies of the skeletal material, individuals A and B.

Dental Age.

The dentition of Skeleton A is represented by the formula:

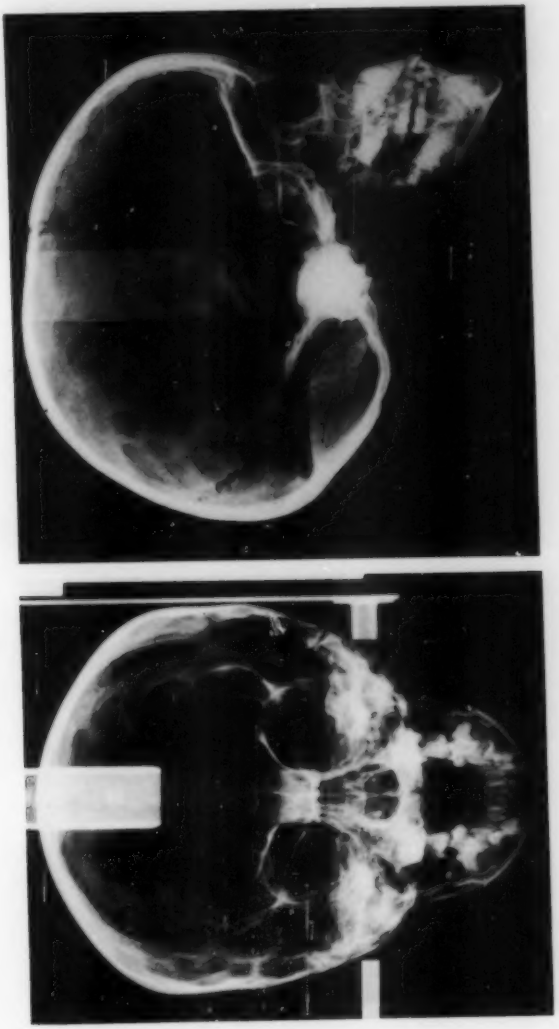
$$\frac{\text{m2 m1 c i2 i1}}{\text{m2 m1 c i2 i1}} \qquad \frac{\text{i1 i2 c m1 m2}}{\text{i1 i2 c m1 m2}}$$

All the deciduous teeth are completely erupted. The first permanent molar is to be seen in its crypt.

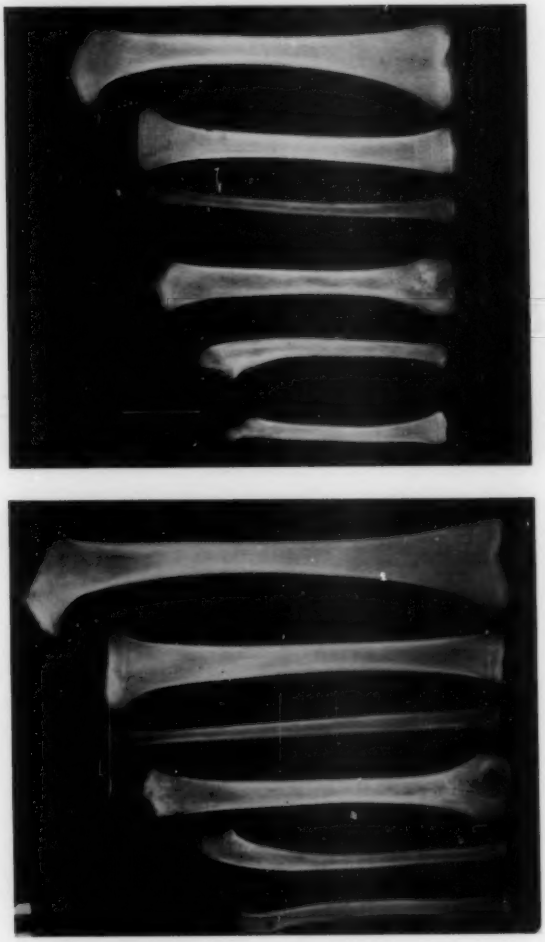
The dentition of Skeleton B is represented by the formula:

$$\frac{\text{(m2) m1} - \overline{\text{i2}}\ \text{i1}}{\text{(m2)}\ \overline{\text{m1}} - \overline{\text{i2}}\ \text{i1}} \qquad \frac{\text{i1}\ \overline{\text{i2}} - \text{m1 (m2)}}{\text{i1}\ \overline{\text{i2}} - \overline{\text{m1}}\ \text{(m2)}}$$

The central incisor and the first upper milk molar are the only teeth completely erupted. The lateral incisor and lower first milk molars are



X-rays of Skeleton A to show tooth calcification.



A B

X-ray of long bones to show transverse striations on ends of shafts:
A, Skeleton A; B, Skeleton B.

erupting, while the second milk molar is still well within its crypt. The canine is not to be seen.

Judging by tooth eruption alone Skeleton A is at least 30 months old and Skeleton B is about 14 months.

The tooth eruption schedules are obviously rather gross, e.g., on the eruption basis alone age estimates are uncertain between completion of the milk dentition at 30 months and appearance of first permanent molar at 6 years. To remedy this situation Broadbent[1] has prepared the more exact tooth calcification age estimate, based on the X-ray study of calcifying teeth.

The skull of Skeleton A has been X-rayed, that of Skeleton B has not. In the X-rays of A (plate 1) it will be seen that the crown and neck of M1 are completely formed, and that the neck of M2 shows beginning calcification. On the basis of this condition the age of Skeleton A may be placed as approximately five years.

Skeleton B, which is fragmentary, cannot be studied in the above detail, but through the care of Mr Bowman and his associate the crowns of M1 were recovered, and enough of mandible and maxilla to demonstrate that M2 has not started to calcify. On this basis the age of Skeleton B may be stated as approximately one and one-half years.

Age According to Estimated Stature.

Pearson[2] has worked out a series of formulae for the calculation of stature from individual bones.[3] These, however, apply to adults only.

Martin,[4] quoting Saller, and Sawtell-Wallis[5] offer data on the body proportions of growing children. From their data we learn that at about 2 years of age thigh (femur) length is 18% of total height; at 4 years it is 22% of total height.

If we apply these figures to Skeletons A and B, in whom femur length is 225.0 mm. and 157.0 mm. respectively, we calculate total statures of 1022.7 mm. and 872.2 mm. respectively. These may be referred to the Baldwin-Wood Tables:

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[1] B. H. Broadbent, Unpublished research on dental calcification, 1932.

[2] K. Pearson, On the reconstruction of the stature of prehistoric races (Phil. Trans. Roy. Soc., Ser. A, Vol. 192, 1899, pp. 169–244).

[3] For example: Stature=813.06 mm.+1.880 Femur; 706.41 mm.+2.894 Humerus; 786.64 mm.+2.376 Tibia. Male Whites.

[4] R. Martin, Lehrbuch der Anthropologie (Jena, 1928), Vol. 1, p. 414.

[5] R. Sawtell-Wallis, Relative growth of the extremities from 2 to 18 years of age (Amer. Jour. Phys. Anthrop., Vol. 16, 1931, pp. 171–93).

		Males	*Females*
B	872.2 mm.	26–27 mos.	28–29 mos.
A	1022.7 mm.	53 mos. plus	54–55 mos.

If we assume both skeletons to be male, then B is just about a little over two years, A just about four and one-half years.

Growth in height does not seem to have been retarded in either skeleton, unless we attach significance to the fact that A is not quite up to the estimated dental age of five years. But this difference is well within the accepted range of variation.

Age According to Length of Long Bones.

The problem of growth in length of femur, tibia, and radius has been studied in detail by Seymour, using the skeletal and X-ray material available in the Laboratory of Anatomy.[6] According to him the length of these bones at birth is as follows:

Femur	101 mm.
Tibia	87 mm.
Radius	68 mm.

TABLE 1. MEASUREMENTS OF THE LONG BONES

Bone	*Skeleton A*		*Skeleton B*	
	Right	*Left*	*Right*	*Left*
Femur				
Length—total	225.0 mm.	226.0 mm.	157.0 mm.	157.0 mm.
Length—shaft	203.0	206.0	142.5	143.0
Width—mid	14.0	14.0	11.0	11.0
Tibia				
Length—total	190.0	187.0	132.0	133.0
Length—shaft	171.0	171.0	118.5	119.5
Fibula				
Length—total	—	172.0	—	—
Length—shaft	—	167.5	116.0	115.5
	Prox. end broken	Prox. epiph. missing	No epiph.	No. epiph.
Humerus	Head and great tub. united		Head and great tub. not united	
Length—total	164.5	165.5	116.5	117.5
Length—shaft	155.0	156.0	112.5	112.5
	No dist. epiph.	No dist. epiph.	No dist. epiph.	No dist. epiph.

[6] W. Seymour, Unpublished research on the growth of the human long bones, 1933.

Radius				
Length—total	—	—	—	—
Length—shaft	116.0 No epiph.	— No epiph. Dist. broken	83.0 No epiph.	83.5 No epiph.
Ulna				
Length—total	—	—	—	—
Length—shaft	— No epiph. Prox. broken	130.5 No epiph.	93.5 No epiph.	94.0 No epiph.

Reference to Table 1 will serve to establish the amount of growth in each of the long bones studied in Skeleton A and B.

Skeleton A			*Skeleton B*		
Femur	225–101 mm.	= 124 mm.	Femur	157–101 mm.	= 56 mm.
Tibia	190– 87	= 103	Tibia	132– 87	= 45
Radius	116– 68	= 48	Radius	83– 68	= 15

In all femora and tibiae the epiphyses were present. In both radii they were absent.

Seymour tells us that the annual rate of growth in the ends of these bones is as follows, including both epiphyseal and diaphyseal growth:

Proximal femur	6.2 mm. per year
Distal femur	16.8
Proximal tibia	11.0
Distal tibia	10.3
Distal radius	10.3
Proximal radius	1.35

If the total observed growth be divided by the annual rate we will ascertain the age in years. The resultant age figures are given:

Skeleton A		*Skeleton B*	
Femur	5.4 years	Femur	2.4 years
Tibia	4.8	Tibia	2.1
Radius	4.1	Radius	1.3

If we take an arithmetic average, then Skeleton A is 4.8 years old, Skeleton B is 1.9 years old. The average deviation in both is 0.4 years. In both skeletons the estimation of age from the femur is above the average, and the estimation of age from radius is below the average. Tibia seems to be the more exact. This variability, however, is really no more than may be expected on either side of the arithmetic mean. To a certain extent the range may be explained by the difficulty of measuring rate of

growth in proximal femur, and the absence of epiphyses in the radii of A and B.

The evidence from the study of growth of femur, tibia, and radius may be summarized by stating that A is about five years old, B about two years old.

Age According to the Femoral Shaft Index.

In Table 1 the diameter of the shaft of the femur at its mid-length is given as 14.0 mm. for Skeleton A, 11.0 mm. for Skeleton B.

The relation of thickness of compacta to medullary cavity has been studied by Venar[7] using the X-ray as the basis of measurement and analysis. He has formulated the femoral shaft index as the ratio between the combined thickness of the compacta and the medullary cavity in the index:

$$\frac{\text{compacta} \times 100}{\text{cavity}}$$

The diameter of the femoral shaft, when measured on the X-ray film is 14.1 mm. for Skeleton A, and 11.1 mm. for Skeleton B, a magnification of but 0.1 mm. in each instance. This is so slight as to be negligible. If, now, we measure the compacta and cavity on the film, we obtain the following results:

	Compacta	*Cavity*
Skeleton A	6.9 mm.	7.2 mm.
Skeleton B	6.1	5.0

The resultant index values are A, 0.96 and B, 1.2. According to Venar the index value ranges from 3.0 at birth to 1.0 at 18 months. The value 1.2 is found at about 17 months, the value 0.9 at about 24 months and thereafter.

These index values are at a variance with other estimates of age. This is of significance, and points to retardation, for not only are the proportions behind, but shaft width as well: 11.0 mm. is reached at about 11 months; 14 mm. at about 16 months. It is very probable that demineralization has retarded bone growth.

The femoral shaft index in the present instances does not help us much with chronological age. It does, however, throw considerable light on skeletal age, a problem to which we shall now turn as we consider the skeletal indications of health history.

[7] Y. Venar, Unpublished research on the growth in femoral width, and on the changes in the femoral shaft index, 1933.

Health Vicissitudes.

Mention has already been made of the transverse scars of the long bones, with particular reference to their import in the measurement of growth increments. We must consider them in a different light: their true meaning in terms of basic cause.

Todd,[8] Harris,[9] Park and Howland,[10] and others have discussed the problem of the cause of the transverse lines or "scars" observed not infrequently in the X-rays of the ends of growing long bones. Todd, in Part II of the *Growth and Development of the Child*, states as follows:

> Certain of the deficiency diseases, notably scurvy and rickets, present very striking interferences with growth and development. Even when a child with scurvy is apparently well nourished there is an arrest of intercellular matrix formation at the growing ends of the bones which shows in the roentgenogram as a dense white line. Arrest of bony growth is the obvious consequence. Rickets does not affect the foundation substance so much as the actual texture of the bones. The secondary trabeculae, constituting the supply of mobile calcium, are absorbed . . . (p. 39).
>
> Associated with defects in appearance of ossific centers are the rings which are evident in all long bones after exanthemata. They mark pauses in bony growth. A crowded mass of these rings at the lower end of the tibia and less frequently at the lower end of the radius indicates a feeding problem or long continued low or intermittent fever . . . (p. 89).

If the X-rays of the long bones of Skeletons A and B (plate 2) be examined the following transverse lines will be noted (measurements in mm. are distances from ends of shaft):

Bone	*Skeleton A*	*Skeleton B*
Dist. Radius	2 scars: 7.2, 6.0 mm.	6 scars: 12.5, 7.0, 6.0, 4.3, 3.0, 1.0 mm.
Dist. Tibia	7 scars: 15.0, 12.5, 11.5, 9.8, 7.0, 5.2, 1.5	6 scars: 16.0, 10.1, 8.2, 6.0, 5.0, 3.3
Prox. Tibia	3 scars: 9.8, 7.5, 6.2	4 scars and cessation: 14.0, 7.5, 6.0, 3.0
Dist. Femur	4 scars: 16.0, 14.2, 12.0, 2.5	2 scars: 5.0, 2.5
Dist. Fibula	Scar at end is indication of cessation of growth	5 scars and cessation: 12.0, 10.0, 6.0, 4.0, 2.5
Humerus	———	Cess. of growth, distal and proximal

[8] T. W. Todd, Growth and Development of the Child (New York, 1933).

[9] H. A. Harris, The growth of the long bones in childhood (Archives Internal Medicine, Vol. 38, 1926, pp. 785–806).

[10] E. A. Park and J. Howland, The radiographic evidence of the influence of cod liver oil in rickets (Bulletin, Johns Hopkins Hospital, Vol. 32, 1921, pp. 341–44).

In both individuals the scars of arrested development are evidence of either repeated illnesses or an intermittent illness of approximately one and a half years duration. It is not without significance that in distal tibia of Skeletons A and B there is a record of an illness at the same time: 15.0 mm. and 16.0 mm., respectively. This virtual identity does not hold for the other bones, nor is there such complete uniformity thereafter. The fact remains, however, that the onset of illness was about the same for both, and that for one and one-half years prior to death both the children were very sickly.

The problem of the nature of the illness cannot be solved so easily. The history of emigration to the West is replete with struggles against almost overwhelming odds; far more against problems of diet than the bitter enemy of expansion, the Indian whose domains were being invaded. The difficulty was not so much food *per se* but the right kind of food: a balanced diet. Malnutrition took its toll of young and old, especially the young. It seems probable, therefore, that these scars are dietetic in origin.

The skeletons offer other interesting evidence of arrest in growth. The skull of Skeleton A has been preserved so well that it has been possible to make an accurate restoration, which has subsequently been X-rayed in the Broadbent-Bolton Roentgenographic Cephalometer. In Figure 1a the lateral diameters have been traced and superimposed upon the nasion-sella with those of BS 2324(2), a physically fit and constitutionally healthy male White aged four years. In Figure 1b the facial diameters have been traced and superimposed upon the Frankfort Horizontal and the sagittal plane of the skull, passing through nasion. Sutural details have not been shown due to slight warping and marginal erosion.

The lateral view demonstrates that the cranium of A is uniformly smaller, and that, with the exception of mandible, the facial skeletons are approximately of the same stage of development with respect to length and height. The frontal view also demonstrates smaller size of cranium in A. The significance of this has been noted by Bakwin and Bakwin:[11]

> Relative to total body length, infants with acute intestinal intoxication are smaller in their transverse dimensions (diameter of face, bigonial diameter) and in their chest circumference than are healthy infants, from the same social invironment . . . (p. 402).

The face of Skeleton A substantiates the evidence of the long bones: there is a skeletal history of long-continued illness.

[11] H. Bakwin and R. M. Bakwin, Body build in infants. III. Body build in disease (Jour Clin. Invest., Vol. 10, 1933, pp. 369–403).

In this connection let us look at Figures 1c and 1d, superpositions in the FH of the contours of WRU 1801 and WRU 818.

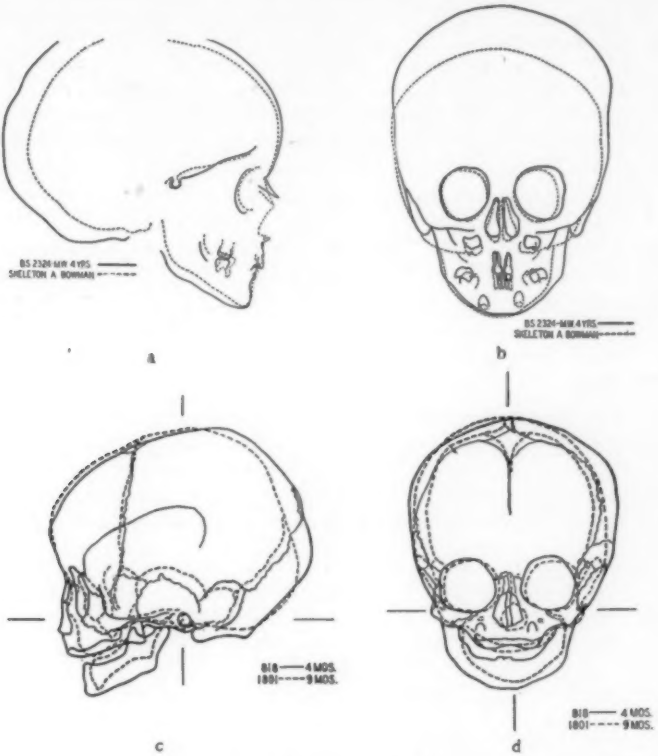

FIG. 1. a, b, Superposition of skull of Skeleton A with contour of BS 2324 (MW aged 4 yrs.): a, norma frontalis to show relative head-size; b, norma facialis to demonstrate relative transverse facial diameters.

c, d, Superposition of B 818, aged 4 months, and B 1801, aged 9 months: c, to show relative head-size; d, to demonstrate relative transverse facial diameters.

WRU 1801. Female White. Age nine months, thirteen days. Supposed to be a six months baby. Birth weight three pounds. Father ran away and child had been in boarding home for six weeks before coming to hospital. It had been ill all this time, with severe cough and fever for last week at least. Child was acutely ill and

gradually went from bronchitis to broncho-pneumonia. Also subcutaneous abscesses, otitis media, and decomposition. Blood culture short chain streptococci. This child was ill at least two months before death.

WRU 818. Male White. Age four months. Full term, normal, healthy. Sudden death, intussusception.

The contrast is striking: the one debilitated and demineralized; the other cut off in the full vigor of perfect health; the one handicapped by environment and disease, the other fostered in its postnatal growth and development; the one wasting away, the other stricken by sudden death.

The picture reminds us strikingly of the comparison of A and BS 2324(2): facial and cranial contours are absolutely and relatively smaller in the presence of wasting illness. We cannot escape the conclusion that both sets of superpositions involve identical situations, viz., the comparison of the cranio-facial proportions of a normal healthy child with those of a child in whom illness has arrested, or at least retarded, growth.

Summary.

1. The two skeletons of children, A and B, excavated in an "Indian mound" near Hartsburg, Missouri, presumably buried in coffins, have been adjudged to be White, rather than Indian. Sex has not been definitely stated, but it is probable that Skeleton A, the larger, is a male.

2. The age of the children at the time of death has been estimated according to the several criteria established for the developmental age:

Analysis	*Skeleton A*	*Skeleton B*
Dental Age		
Eruption	Over 30 mos., under six years	Ca. 14 mos.
Calcification	Ca. 5 years	Ca. 18 mos.
Estimated stature	Four and one-half years	Slightly over 2 years
Length of long bones	4½ to 5 years	About 2 years
Femoral shaft index	Over 2 yrs., under 2½. There has evidently been retardation.	Ca. 17 mos.
Centers of ossification	Have not been considered in detail because many not recovered. Those present are in general compatible with 4–5 yrs. for A and 2 yrs. for B.	

3. The transverse lines of the long bones of both children reveal that for about one and one-half years prior to death both had been in very poor health. It is probable that improper nourishment was the cause.

4. The transverse facial diameters of A are relatively small, substantiating the conclusion of ill health.

So much for a summary of conclusions. The real import of the present study is to drive home to the archaeologist that skeletal material—even "mere bones"—can no longer be totally disregarded in his work. No matter how fragmentary the skeleton, how incompletely it is present, each part tells its own story in the recording of the age and health and physical history of the individual.[12]

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[12] All cranial X-rays used in this study have been made on the Broadbent-Bolton Roentgenographic Cephalometer. I am indebted to Dr B. H. Broadbent, Director of the Bolton Fund, for permission to reproduce the X-rays.

A PREHISTORIC CAVE CULTURE IN SOUTHWESTERN TEXAS[1]

By FRANK M. SETZLER

THE state of Texas, characterized by its vast size, diversified climate, fauna and flora, surrounded by divergent aboriginal culture centers, may be considered at the present time as containing the possible solution to many important archaeological problems. Among them may be cited the northern migrations of autochthonous Mexican cultures; the southern development and western spread of a Mississippi Valley mound or protohistoric Indian pattern; the southern extremity of a Plains complex; and last, but most important for consideration here, the eastern migration and influence of the better established prehistoric Southwestern groups.

To be more specific: in the southeastern corner of Texas, around Brownsville, a phase of the Huastec culture has been identified by J. A. Mason[2] and myself.[3] In the northeast, J. E. Pearce reports artifacts similar to Mississippi Valley mound-building cultures, extending as far west as the Trinity River.[4] While in the northwest or Panhandle region, W. C. Holden and F. V. Studer have explored two large pueblo-like ruins in the Canadian Valley which show definite Pueblo influence.[5] The finding of Glaze I and Biscuit A potsherds, which have been dated from approximately 1350 to 1450 A.D. by the Douglass Tree Ring study, makes possible a definite chronology for these ruins. The more distinctive and characteristic pottery from these sites, however, would seem to indicate a predominant Plains or Mississippi Valley culture. West of Texas are the well known Basket Maker and Pueblo phases, whose evidence within the state will be dealt with here in more detail. Finally we have the recent Folsom and Yuma projectiles, discovered by E. B. Howard, associated with certain extinct animal forms, just north and west of Texas in the Guadalupe Mountains.[6] A few points have been recovered from certain areas within the Panhandle region.[7] Five hundred square miles of unexplored territory in Mexico lie to the south. It would seem obvious, then, that Texas might contain the archaeological data so necessary at the present time for developing the relationships of these seemingly unrelated groups of prehistoric Indians.

[1] Printed by courtesy of the Smithsonian Institution.

[2] Mason, American Anthropologist, Vol. 32: 371.

[3] Setzler, Explorations and Field-Work of the Smithsonian Institution in 1931, Publ. 3134, p. 133.

[4] Pearce, American Anthropologist, Vol. 34: 670–87.

[5] Holden, Bulletin, Texas Archeological and Paleontological Society, Vol. 5: 39–52.

[6] Howard, Bulletin, Texas Archeological and Paleontological Society, Vol. 4: 7–19.

[7] J. D. Figgins, Natural History, Vol. 27, No. 3: 229–331; H. J. Cook, Natural History Vol. 27, No. 3: 241; F. Bryan, American Anthropologist, Vol. 33: 18, 21.

Coming now to the southwestern or Big Bend region of Texas, we find that although a certain amount of investigation has been prosecuted, the published reports dealing with detailed archaeological excavations only tend to show how vast is the field yet to be studied. Since the establishment of Sul Ross State Teachers College in Alpine, Texas, during 1920, a serious attempt has been made by Victor J. Smith to keep a careful record of the material collected in the immediate vicinity. Within the last three years several short reports were written by him describing his work around Alpine.[8] Mr E. F. Coffin has had his excavation of Bee Cave Canyon published by the Museum of the American Indian.[9] The University of Texas,[10] Austin, and the Witte Memorial Museum,[11] San Antonio, have recently published reports on their respective investigations of caves near the Pecos River watershed.

In the spring of 1927, Dr F. H. H. Roberts, Jr., inaugurated near El Paso the Smithsonian Institution's program in the Big Bend.[12] (In this paper I am considering the region bounded on the east by the Pecos River, on the north by the Panhandle and New Mexico, the west and south by the Rio Grande and the states of Coahuila and Chihuahua, Mexico, as the Big Bend region of Texas.) Mr M. W. Stirling made a reconnaissance in 1930 around Marfa, Texas, selecting caves on the Knight ranch for future investigations.[13] In the spring of 1931 I continued the program by excavating one large and several small caves on the Mollie B. Knight ranch, 170 miles southeast of El Paso in Presidio County.[14] From March to June, 1932, excavation of caves numbers 1 and 2 on Mule Ear Peaks and the Cartledge cave near the Chisos Mountains in the extreme southwestern part of the state was completed, and two in Sunny Glen Canyon near Alpine.[15] Two caves were excavated during February to June, 1933, along the Pecos River near its mouth where it empties into the Rio Grande.[16] The data

[8] Smith, Bulletin, Texas Archeological and Paleontological Society, Vol. 3: 60–69, Vol. 4: 55–62, Vol. 5: 57–65; Bulletin, West Texas Historical and Scientific Society 21: 48; unpublished manuscripts; American Anthropologist, Vol. 29: 286.

[9] Coffin, Indian Notes and Monographs, No. 48, 1932.

[10] Pearce and Jackson, Bulletin, University of Texas, No. 3327; Anthropological Papers, Vol. 1, No. 3.

[11] G. C. Martin, Bulletin, Witte Memorial Museum, No. 3.

[12] Roberts, Smithsonian Miscellaneous Collections, Vol. 81, No. 7, Publ. 3009.

[13] Stirling, Explorations and Field-Work of the Smithsonian Institution in 1930, Publ. 3111, p. 173.

[14] Setzler, *op. cit.*, pp. 133–40.

[15] Setzler, Explorations and Field-Work of the Smithsonian Institution in 1932, Publ. 3213, pp. 53–56.

[16] Setzler, Explorations and Field-Work of the Smithsonian Institution in 1933, Publ. 3235, pp. 35–37.

and conclusions herein offered are based primarily on the Smithsonian's investigations.

Even though the material culture of the prehistoric Indians in the Big Bend is rather simple and very uniform throughout, a detailed technical description of the more important artifacts will be essential. These Indians made coiled, twined and plaited baskets. The coiled baskets consist of three important types. First, baskets made with a single bundle-of-grass foundation, with yucca thread stitches split on the convex or non-work surface, sewed toward the left of the worker on the concave or inside of the basket. This is the most characteristic type in the western part of the Big Bend, but appears as a secondary type along the eastern boundary or Pecos River region, where the interlocking stitch over a single bundle foundation is more prevalent. Neither the split stitch type nor the single *bundle* foundation has ever been found among Basket Maker or Pueblo culture artifacts. While the split stitches on the non-work surface have been reported from Lovelock Cave, Nevada, and Ozark caves, as well as among the modern Maidu, Washo and Ute Indians, the foundation in each case differs from the Big Bend's single bundle foundation.[17]

A second coiled technique has the single *bundle* foundation with interlocking stitches. Several variations in regard to the thickness of the bundle and closeness of the stitches exist. This process is predominant along the Pecos River, but is also found farther west. It somewhat resembles a form considered by Dr Weltfish as intrusive among the typical Basket Makers, but it differs from this type, however, in having a *bundle foundation* rather than the *single rod*, which the Days found in Canyon de Chelly.[18]

The third type is the wrapped twined, or horizontal and vertical single rod foundation, with all the horizontal rods on the convex surface or outside of the basket, and sewn with a yucca leaf. The stitch binds only one horizontal rod to the vertical ones and does not interlock with the adjacent horizontal rod. This type has been described from only one other site, Gypsum Cave, Nevada, by M. R. Harrington.[19] The fragment illustrated by him in Figures 22 and 23 in his final Gypsum Cave report is an exact duplicate of this unusual type.

Plaited baskets are of the diagonal over-two-under-two weave. The edge or selvage is uniquely finished off with the characteristic split-stitch type of coiled basketry technique, described as type one of the coiled wares, with a draw string of lechuguilla fiber. This type of twill-plaited basket, except for the selvage, occurs in numerous Pueblo culture horizons.

[17] G. Weltfish, American Anthropologist, Vol. 32: 493.

[18] Weltfish, Smithsonian Miscellaneous Collections, Vol. 87, No. 7, Publ. 3169, pp. 10, 40.

[19] Harrington, Papers, Southwest Museum, No. 8, pp. 44–45.

Large quantities of checker or over-one-under-one and the over-two-under-two plaited mats occur. On the Pecos River we found an extended burial in the flesh wrapped in five painted over-two-under-two twill-plaited mats. Beside this body, folded in a similar large well-preserved mat, with red lines and dots painted on the outside, were the remains of several cremated adult bones.

The sandals may be classified under three main types, all different from those thus far reported from the Southwest proper. The first and most common type, known as the "Fish-tail," has two opposing warp elements of whole yucca leaves or lechuguilla cordage, and small flat strands braided between the warps. The second type, rectangular in shape, is much the same as the "Fish-tail" except that for thickness and durability a greater number of leaves interlock between the braided strands. The third type consists of simple braiding without the extra reinforcing strands. All types are made from the coarse yucca or sotol leaves which sometimes are shredded and sometimes retain their original form. No indication has ever been found of the typical Basket Maker or Pueblo square-toed, tightly woven and well made sandals. A few leather soles, perhaps a prototype of the moccasin, also served as a protection from the sharp jagged rocks in these canyons.

Cradles are represented by a single complete specimen and several fragments of others. These were found only in the Knight cave in the western part of the Big Bend. The perfect specimen consists of thin twigs of uniform size, approximately two feet long, bent and bundled together at each end and sewn with a two-strand two-ply twisted yucca thread, the sewing cords being at intervals of about two and one-half inches. Other types of cradles found along the Pecos River region are mentioned in the Witte Museum report.[20]

Numerous fragments of coiled netting indicate the use of snares. Two-ply apocynum cords were used to make aprons, with human hair cordage as tie strings. Many yards of loose lechuguilla and apocynum fibre cordage were scattered about in the deposits.

Along the Pecos River most of the burials were wrapped in fur robes, made by twisting narrow strips of hide with the fur still attached around a lechuguilla cord foundation or twisted about itself without a foundation. The fur robes are similar to those found among Basket Maker II and III artifacts.

Among the wooden specimens are objects which afford a clue to a possible chronology between the Big Bend Indians and those in the Southwest. The most important artifacts of this nature consist of the following

[20] G. C. Martin, *op. cit.*, pp. 41, 42.

fragments: the proximal end or handle of an atlatl, decorated with criss-cross lines; atlatl shafts, foreshafts, and bunt-points, and numerous fragments of grooved clubs. Two small fragments of painted twined woven bags, and a rectangular piece of cloth complete and selvaged at both ends (three and one-half inches long and one inch wide) made from painted two-ply apocynum cordage, the fibres sewn together with a very light thread (unidentified) in the same manner as the unique technique on the so-called cradle, are suggestive of the Southwest. These specimens together with the aforementioned fur robes are similar to Basket Maker III and Pueblo I artifacts.

Associated with these were many cane arrowshafts and long slender wooden arrow foreshafts, pointed and tapered at one end to fit into the cane shaft, and split at the other end to receive the projectile point. In one of the Pecos River caves we found the nock end of a wooden bow. Some of these nocked shafts and foreshafts were found at a greater depth in the deposit than the atlatl fragments. This probably indicates that both the atlatl and the bow and arrow were used contemporaneously by the inhabitants of these caves. Coffin reports a similar association in Bee Cave Canyon, Brewster County, in the western part of the Big Bend.[21] Miss Lois Gould found a similar association of artifacts while studying part of a collection from a cave seventy miles northeast of El Paso, Texas. These artifacts consisted of typical Big Bend sandals, grooved club, atlatl bunt-point, arrowshaft and arrow foreshaft, fur and yucca cords and miscellaneous objects.[22]

Cane tubes, containing numerous minute seeds, had one end closed by the septum in the cane and the other plugged with lechuguilla fibres. Large pieces of wood were cut and shaped to form scoops. Split pieces of small twigs were bent into elliptical loops, the ends tied together with yucca fibres. Their purpose has not yet been definitely determined, but since the rounded ends show a certain amount of wear, I have temporarily considered them as a form of scraper. Numerous sotol and lechuguilla flower-stalks were split in half for small fire hearths, while rounded pieces of wood were used as fire drills. A number of small twigs tied together at both ends might have served as parts of a snare.

Animal, bird and fish bones, snail and mussel shells give evidence of the fauna used for sustenance. From cave number 1 at Mule Ear Peaks parts of three California condors, not associated directly with the human deposit, were identified by Doctor A. Wetmore.[23] It is now extinct except

[21] Coffin, *op. cit.*, pp. 28, 61.

[22] Gould, Oklahoma Academy of Science, New Series, Vol. 9, No. 456, 1929, pp. 155–59.

[23] Wetmore and Friedmann, The Condor, Vol. 35, No. 1: 37–38.

in certain portions of California. Ornithologists consider this bird belongs to the Pleistocene fauna. Other fragments have been found in cave debris from the Guadalupe Mountains in New Mexico, as well as in the Gypsum cave in Nevada. Numerous leg bones of the deer were fashioned into awls and other implements. Snail shells were painted and pierced for stringing, opercular bones of suckers were made into gorgets.

The stone artifacts consist of large elliptical mortars and flat metates, numerous manos, several large flint knives, and a variety of projectile points and scrapers and stone disc beads. The Pecos caves on the eastern boundary contained a much larger number and greater variety of perfect projectile points and knives than the caves farther west. Some of these notched points are similar to those recovered in the burnt rock mounds of central Texas.[24] A few of the artifacts besides the mats were painted with red and black lines, namely, the scapula of a deer, a small section of split sotol stalk, snail shells, large quantities of small water-worn pebbles, and a buckskin bag.

So much for the artifacts. The only skeletal remains recovered in the western portion of the Big Bend are infants. One restored skull of a child, approximately two years old, sex undeterminable, has a cephalic index of 70.3. Two restored skulls of desiccated adult female bodies, found along the Pecos, have cephalic indices of 65.3 and 67.2 respectively, indicating decidedly long-headed individuals. No evidence of deformation was apparent.

The following general conclusions, based primarily on the eight completely excavated caves, seem justified. First, the caves were used only as temporary shelters, indicated by the lack of deep deposits and absence of adobe structures within the caves. Second, the Indians were semi-nomadic, they cultivated corn, beans and squash extensively in the western part of the Big Bend but no evidence of corn has been found around the Pecos River region. They depended to a large extent upon the fauna, berries, and yucca plants to eke out their livelihood. Third, their material culture is notably uniform.

The correct allocation of these Indians to their proper chronological and cultural position cannot as yet be too definitely stated. Thus far no fired or sun-baked pottery has been found, so one reliable criterion for chronology is denied us. No European evidence has ever been recovered. The presence, however, of atlatl paraphernalia, grooved clubs, twined woven bags, fur robes, together with the bow and arrow, in caves where no apparent stratification occurs, does offer a clue. A somewhat similar association of artifacts has been established by Morris in Canyon del

[24] Pearce, Bulletin, Texas Archeological and Paleontological Society, Vol. 4, pl. 10.

Muerto and Roberts in Chaco Canyon, New Mexico, caves which produced late Basket Maker III and Pueblo I material. This seems to be the only indication of similarity to the Southwestern cultures or to a possible chronology. The coiled basketry and sandal types as well as numerous less important objects are entirely different in their technique from those found among Basket Maker or Pueblo remains. Where then should this material complex be placed relatively speaking?

My personal opinion, at the present time, is that we should regard the Cave-dwellers of the Big Bend region of Texas as a more or less isolated or independent group, primarily, because of the variation in similar types of artifacts and the lack of sufficient evidence showing a definite relationship with the well established Basket Makers or Pueblo Indians. The variations seem to outweigh the few obvious similarities. The Texas cave Indians may be a part of a larger prehistoric basic culture centering in northern Mexico, especially in Coahuila. Certain similarities can be found among the modern Pima, Papago, Maidu, Washo and Ute Indians, especially in the coiled basketry. Prehistoric similarities are evident in the material culture from Lovelock and Gypsum caves in Nevada. Perhaps the cave-dwellers in the Big Bend of Texas represent a cultural lag retaining the basic features of a cave culture originating in the unexplored northern regions of Mexico, while the Basket Makers, with a similar origin, developed their own specialized complex or phase after residing in the Southwest. The Indians to the east and west of the Southwest may have retained all of the basic features and were not influenced by the later Pueblo cultures. Granting this hypothesis, then the few cultural similarities, which may have been retained from the original basic pattern, would account for artifacts similar to the Basket Maker III and Pueblo I periods. If the cave-dwellers in Texas and the inhabitants of Lovelock and Gypsum caves originated from the Southwest Basket Makers, we should have to account for the complete loss of the typical coiled basketry and sandal techniques as well as all other variations.

When all the data is considered as a unit it seems to me necessary to treat this cave culture of the Big Bend region in Texas as a separate entity rather than an example of, or cultural development out of, the classical Basket Maker, at least until future excavations produce more direct connections with the Southwestern cultures. These hypotheses do not imply an antiquity for the Big Bend cave cultures greater than the Basket Maker III or Pueblo I cultures. Even a relative chronology must be very indefinite for the present.

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SOUTHERN PUGET SOUND SALISH KINSHIP TERMS

By ARTHUR C. BALLARD

THE kinship terms in the appended list have been obtained from informants of the Puyallup, Duwamish, and Snoqualmi groups, residing in King and Pierce Counties, Washington. All speak the same language, with slight dialectic variations. These terms will in the main be valid, I believe, for adjoining groups on the south, southwest and north, whose culture is almost identical with that of the groups whose kinship terms are here listed.

There seems here to be no distinction between parallel cousin relationship and cross cousin relationship nor between other relationship on the father's side and that on the mother's side. There is no evidence of cross cousin marriage. Residence was predominantly but not invariably patrilocal. Exogamous marriage was a favored practice, almost universally followed. A certain group having a tradition of endogamy was considered "low class" by its neighbors. Polygyny was widely practised among those of high rank. Numerous related persons lived in a single communal house during the winter months. Certain derivative expressions whose exact significance has not yet been made entirely clear to me seem intended to distinguish in some degree the varied relationships arising from these practices.

In listing the terms it has seemed best to recognize two main groups, kindred by blood and kindred by marriage, and within each group to list the derivative, or compound, terms separately from the simple.[1]

Noteworthy is the change in nomenclature employed in certain cases upon the death of an intervening relative. Thus upon the death of one's spouse the term sba'lotsiD is substituted for kwel^{xu}, in so far as any relationship is presumed to continue. Incidentally, it seems to have been obligatory for brother, or sister as the case may be, to marry the surviving spouse of the deceased. Upon the death of one's parent the surviving brother, sister or cousin of the deceased is called yɛla'B. Upon the death of yɛla'B he or she is again called kasi'' or pus. Reciprocal to yɛla'B is skʋla'djitał, substituted for the term sta'łał. Accordingly the expressions yɛla'B and skʋla'djitał are used between elderly persons and young persons distantly related.

Certain terms, such as kwel^{xu}, sba'lotsiD, ska'', so'qwa and sxa'xa, are reciprocal in themselves. The term ka'ya, grandmother, is sometimes

[1] The phonetic scheme is that of the Phonetic Transcription of Indian Languages (Smithsonian Misc. Coll., Vol. 66, No. 6, 1916).

used by an elderly person in addressing a child. The derivative term tcɬba′dəb signifies not only husband of speaker's aunt but also speaker's stepfather. This double significance is apparently based upon certain marriage customs formerly prevailing. Likewise, the term tcɬta′dəb signifies either speaker's stepmother or wife of his uncle.

In the use of terms such as ska″, so′qwa and others, equally applicable to persons of either sex, the sex of the person to whom reference is made is indicated by the use of a demonstrative: for example, ti^{ɬ} ska″, that elder brother; tsi^{ɬ} ska″, that elder sister. In but few instances is the choice of terms used based upon the sex of the speaker. Terms in question are xα′ɬtəd, brother-in-law, and stc'α′bac, sister-in-law, brother-in-law. The former term is used reciprocally between speakers of the male sex only, while the latter is used not only reciprocally by female speakers but by a person of either sex in referring to a person of the opposite sex. A different usage seems to prevail in the employment of the terms a″cɬd and alc. The term a″cɬd is reciprocal between persons of the same sex, while the term alc is used between persons of opposite sex to designate a sibling or merely a friend.

Persons whose respective wives and husbands are sisters, brothers, or brother and sister, while perhaps not considered as kindred, stand in a special relationship to each other and are called sq'o″idup. Full brothers and sisters are called particularly ^{tcux}sq'o″aB. Both of these terms are built upon the root syllable q'o', signifying "join," "unite," "assemble."

The reciprocal term sxa′xa not only designates son-in-law, father-in-law, etc., of the speaker but may also designate brother or sister of the speaker's father-in-law or mother-in-law and likewise son-in-law or daughter-in-law of speaker's brother or sister.

All blood kindred of a married person address all blood kindred of his or her spouse as kwel^{xu}. He himself addresses only the remote kindred of his wife as kwel^{xu}; the near kindred being called specifically sxa′xa, xα′ɬtəd, stc'α′bac, etc. Apparently kwel^{xu} is the all-inclusive term for marriage relative.[2] Upon the death of one's spouse the surviving marriage partner calls all the blood kindred of the deceased by the term sba′lotsɬd and is so addressed by them. This does not apply to the blood relatives of the surviving spouse, however. Any relationship formerly existing between

[2] The term kwel^{xu}, "marriage relative," seems to be etymologically related to the verbal forms ukwe′ɬiu and ukwe′ɬiu'a′lik^{u}. The former of these expressions means "he goes to another country, gets a wife and sojourns with his wife's people for a time." The latter means "he brings his wife home to live with his people." The expression is applicable to a person of either sex.

them and the blood kindred group of the deceased is regarded as severed. They are called tsi'ləʙskayu", "related through the dead."

There is no exact counterpart to the English word family.

The expression tɪ'liɣ^{u} preceding a simple term seems intended to restrict its meaning by indicating blood relationship or at any rate a more intimate relationship than would necessarily be shown by the term which it precedes. For example the compound term tɪ'liɣ^{u} so'qwa may be intended to distinguish younger brother from younger cousin. Two brothers whose respective wives are mother and daughter are called tɪ'liɣ^{u} sxa'xa.

Likewise the expression bi'tigwɑ'l following a simple term seems to indicate close association or propinquity of residence. It is known that persons of varying degrees of kinship lived in a common house. Such expressions as tsi'ləʙska'ya, "related through the grandmother," and tsi'ləʙspu's, "related through the aunt," may be intended to distinguish cross cousins from parallel cousins. These terms are seldom used, however. A further study, with concrete examples, should clarify their significance.

KINSHIP BY BLOOD

A. Simple terms

1.	bad		father
2.	skoi		mother
3.	kasi"	Pl. kaskasi"	brother or male cousin of speaker's father or mother
4.	pus	pupu's	sister or female cousin of speaker's father or mother
5.	tsa'pa	tsa'ptsapa	grandfather, brother or cousin of speaker's grandparent
6.	ka'ya	ka'ikaya	grandmother, sister or cousin of speaker's grandparent
7.	tca'biq^{u}	tca'btcabiq^{u}	great grandfather, great grandmother etc.; reciprocally great grandchild, etc.
8.	kwɑ'liyɛ"q^{u}[3]		great great grandfather, etc.
9.	he'wɪlyɛ"q^{u}		great great great grandfather, etc.
10.	bɑ'da	bɑ'dbəda	son, daughter: sex indicated by preceding demonstrative
10a.	bi'bda	bi'bdabəda	diminutive of preceding
11.	sta'lał	sta'ltalał	nephew, niece, son or daughter of speaker's cousin

[3] The term kwɑliyɛ"q^{u} is said to mean "beyond;" hɛwɪlyɛ"q^{u} is said to be derived from hek^{u}, "great" and another word meaning "beyond."

12.	e'bats	e'byebats	grandchild
13.	ska'	^{tux}ska''təd	elder brother-sister, elder cousin
14.	so'qwa	so'qsoqwa	younger brother-sister, younger cousin
14a.	so'soqwa	so'səsoqwa	diminutive of preceding
15.	a''cɪd	i'hicɪd	sibling, friend, brother, sister: spoken by person of same sex
16.	alc	a'lalc	sibling, friend, sister, brother: spoken by person of opposite sex
17.	qɑq^{hu}		elder brother or sister: term of address
18.	yɔla'ʙ	yɔlyɔla'ʙ	brother, sister or cousin of deceased parent of speaker
19.	skʊla'djitaɬ	skʊlkʊla'djitaɬ	son or daughter of deceased brother, sister or cousin of speaker: reciprocal to preceding term
20.	tsaya'ya	tsaya'i'aya	kinsman, kinswoman: general term, not clear whether restricted to kinship by blood

B. Derivative terms

21.	bada'ligwad	related on the father's side
22.	skoi'a'ligwad	related on the mother's side
23.	^{teux}sq'o''aʙ	having the same father and mother: "joined"
23a.	tsi'ɬəʙsq'o''a bi'tigwɑ'l	preceding term amplified: precise meaning obscure, perhaps collective
24.	tsi'ɬəʙsba'd	having the same father: "related through the father"
24a.	tsi'ɬəʙsba'd bi'tigwɑ'l	preceding term amplified
25.	tsi'ɬəʙsko'i	having the same mother: "related through the mother"
25a.	tsi'ɬəʙsko'i bi'tigwɑ'l	preceding term amplified
26.	tsi'ɬəʙskasi''	"related through the uncle"
26a.	tsi'ɬəʙskasi'' bi'tigwɑ'l	preceding term amplified
27.	tsi'ɬəʙspu's	"related through the aunt"
27a.	tsi'ɬəʙspu's bi'tigwɑ'l	preceding term amplified
28.	tsi'ɬəʙstsa'pa	"related through the grandfather"
28a.	tsi'ɬəʙstsa'pa bi'tigwɑ'l	preceding term amplified
29.	tsi'ɬəʙska'ya	"related through the grandmother"
29a.	tsi'ɬəʙska'ya bi'tigwɑ'l	preceding term amplified
30.	ska'' bi'tigwɑ'l	elder brother, term amplified, perhaps collective
31.	tɪ'liχ^{u} ska''	elder brother, perhaps as distinguished from cousin

31a. tɬ'liχʷ ska'' bi'tigwɑ'l	combination of preceding terms
32. so'qwa bi'tigwɑ'l	younger brother: term amplified, perhaps collective
33. tɬ'liχʷ so'qwa	younger brother, perhaps as distinguished from cousin
33a. tɬ'liχʷ so'qwa bi'tigwɑ'l	combination of preceding terms
34. a''cɬd bi'tigwɑ'l	sibling or friend of same sex as speaker: term amplified, perhaps collective
35. tɬ'liχʷ a''cɬd	sibling or friend of same sex as speaker, probably indicating close relationship
35a. tɬ'liχʷ a''cɬd bi'tigwɑ'l	combination of preceding terms
36. a'lc bi'tigwɑ'l	sibling or friend of opposite sex to speaker: term amplified, perhaps collective
37. tɬ'liχʷ a'lc	sibling or friend of opposite sex to speaker, probably indicating close relationship
37a. tɬ'liχʷ a'lc bi'tigwɑ'l	combination of preceding terms

KINSHIP BY MARRIAGE

A. Simple terms

38. tcistˣʷ	Pl. tci'stcistˣʷ	husband (Puyallup dialect)
tcictˣʷ	tci'ctcictˣʷ	husband (Snoqualmi dialect)
39. tcɑ'gwac	tca'hagwɑc	wife
40. sxa'xa	sxa'xaxa	son-in-law, daughter-in-law of speaker, speaker's brother or sister; reciprocally father-in-law, etc.
41. xɑ'ɬtəd	xɑ'ɬxʷɬtəd	brother-in-law, husband of one's cousin, man speaking
42. stc'ɑ'bac	stc'a'habɑc	sister-in-law, brother-in-law, woman speaking; sister-in-law, man speaking
43. kwelˣʷ	kwe'lkwelˣʷ	related by marriage: general term
44. sba'lotsiɒ	sba'lbalotsiɒ	surviving marriage relative after death of spouse: reciprocal term

B. Derivative terms

45. tsi'ləɒstci'stˣʷ	co-wife, "related through the husband"
46. tcɬba'dəb	step-father; husband of speaker's aunt
47. tcɬta'dəb	step-mother, wife of speaker's uncle

48. tcɬbɒda′b	stepson, stepdaughter, son or daughter of wife's brother or sister, son or daughter of husband's brother or sister: reciprocal to the two preceding terms
49. tcɬtsa′pa^{aB}	step-grandfather, husband of grandparent's sister
50. tcɬka′ya^{aB}	step-grandmother, wife of grandparent's brother
51. tcɬe′bats^{aB}	step-grandchild, grandchild of speaker's wife's (or speaker's husband's) brother or sister: reciprocal to the two preceding terms
52. tsiχ^{v}e′bats	husband or wife of grandchild of speaker or speaker's brother or sister; term possibly reciprocal
53. tcɬsxa′xa^{aB}	son-in-law or daughter-in-law of speaker's wife's brother or sister, husband of speaker's stepdaughter: reciprocally uncle by marriage or stepfather of speaker's wife, etc.
54. kwe′l^{xa} bi′tigwα′l	kin by marriage; term used in special sense to designate stepbrothers and stepsisters
55. tci′ɬəɒskayu″	"related through the dead," previously related by marriage
56. sq'o″idup	persons whose wives are sisters; whose husbands are brothers; whose respective husband and wife are brother and sister: term derived from root syllable q'o', "join"
57. tsi′ɬəɒsto′bc	man whose wife is sister to the wife of another (?); "related through the man"
57a. tsi′ɬəɒsto′bc bi′tigwα′l	preceding term amplified
58. tsi′ɬəɒsɬa′dai	woman whose husband is brother to the husband of another (?); "related through the woman"
58a. tsi′ɬəɒsɬa′dai bi′tigwα′l	preceding term amplified
59. tɬ′liχ^{u} sxa′xa	son-in-law related by blood to parent-in-law

AUBURN, WASHINGTON

KNOTLESS NETTING IN AMERICA AND OCEANIA

By D. S. DAVIDSON

THE question of trans-Pacific influences in American cultures has been seriously debated for a number of years. Those who favor a trans-oceanic movement have pointed out many resemblances and several striking similarities between certain culture traits of the New World and Oceania. The theory of a historical relationship between these appearances is based upon the hypothesis that independent invention and convergence in development are not reasonable explanations either for the great number of resemblances or for the certain complexities found in the two areas.

The well-known objections to the trans-Pacific diffusion theory can be summarized as follows:

1. That many of the so-called similarities at best are only resemblances between very simple traits which might be independently invented or discovered,

2. That most of the traits in question are not present among the Polynesians, the great navigators of the Pacific and the only Oceanic people known either to have made great voyages, or to have been equipped in early times with watercraft capable of making extended journeys, but limited to the Australians, Melanesians or Indonesians who are either too poorly equipped with watercraft to have made such excursions or so far removed geographically from America that a trans-Pacific movement, leaving no traces in intermediate areas, would seem most unlikely.

3. That most of the similarities are not concentrated severally either in the Americas or in Oceania but individually are so localized in each region that the diffusion of a large number of traits would entail many independent crossings of the Pacific, a conclusion which seems hardly plausible.

4. That most of the traits involved do not appear on the west coast of the New World, the most likely place for them if brought across the Pacific, but are distributed largely east of the cordillera.

5. That there is no evidence to show that the peoples in the western Pacific who now possess the traits ever reached Polynesia, through which they must have passed if they ventured to the Americas.

6. That the records of the Polynesians do not refer to any visit of peoples passing through their region and that if diffusions took place prior to the arrival of Polynesians, they would have happened at a time when watercraft were hardly developed to the point of successful trans-oceanic navigation.

In spite of these objections, many of which are formidable, it is to be

admitted that many of the resemblances are indeed puzzling, and the chance that some traits may have been carried across the Pacific purposely or inadvertently must be recognized. However, it should be emphasized that the establishing of a trans-Pacific derivation of one trait does not prove that others have had a similar history, nor, vice versa, does the proof that one trait developed in America constitute evidence that the others were also independently invented in the New World.

It is important to note that practically all of the traits listed as examples of a direct historical unity between America and Oceania are perishable or non-material, with the result that archaeology has played but little part in the controversy.[1] This condition is disconcerting to those who are interested in an unbiased appraisal of the situation, although it may be considered as advantageous to the arguments of the extremists of both sides who either find no disproof that certain traits may not have been introduced along the western coast of America where they are now lacking, or no evidence contrary to the supposition that these traits may be but relatively recent independent developments in the American areas they now occupy.

As yet many of the objections to a trans-Pacific route of diffusion, aside from the fact that there is no evidence to show how or when such movements could have happened, have been based upon the supposition that many of the traits could have developed locally in the New World, but very little attention has been given to the evidence in Oceania which may indicate the improbability that certain traits could have been brought to America. It has been more or less tacitly assumed by both sides that the contemporary distributions in the Pacific have been more or less unchanged during the time elapsed since the supposed trans-oceanic diffusions took place, a supposition which seems contrary to logic as well as to the little evidence which is available. Although archaeological material is most fragmentary from Oceania and, in spite of the fact that what we have does not bear upon the problems of the trans-Pacific controversy, there seems to be no doubt but that there has been a constant eastward diffusion of many traits from Indonesia to Melanesia. A few centuries ago, therefore, the eastern boundaries of many of these traits may have been farther west than we observe at present and successively 1000, 1500 or 2000 years ago the distribution may have been much more restricted. Indeed some traits were possibly not in existence in these times. Whether it will ever be possible to come to any satisfactory conclusion as to the antiquity in Oceania of many of the traits concerned in the trans-Pacific controversy

[1] To mention only a few: bark cloth, blow guns, bullroarers, masks, pan-pipes, poison for arrows and for fishing, chewing of narcotics, couvade, etc.

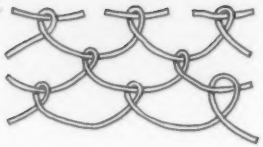
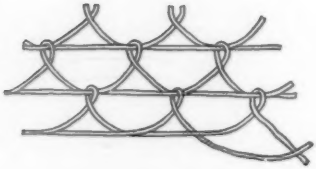
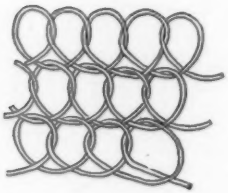
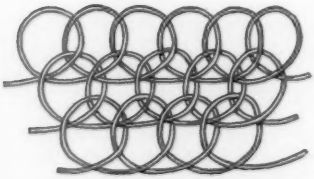
remains to be seen. Certainly the probabilities can be determined in some instances. Investigation into this field may throw important light upon the question of trans-oceanic cultural relationships.

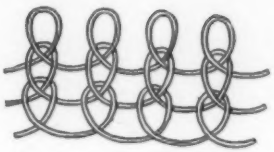
KNOTLESS NETTING

There is one trait which generally has not appeared in the lists of resemblances between the New World and Oceania and that is knotless netting. In the Pacific it is found in most of New Guinea and some of the adjacent islands, is present throughout the eastern half of Australia, occurs in the Gilbert Islands, and similar techniques in stiff basketry are used somewhat differently in Indonesia where they appear to be relatively unimportant. In America, knotless netting is not localized, like many of the parallels to Oceanic traits, but is distributed, with the exception of a few regions, from the habitat of the northernmost Athabascan tribes to Tierra del Fuego. It seems to be prominent along the west coast of South America as well as east of the cordillera and is found archaeologically in pre-Incan graves at Arica. In addition, it is important to note that not only is knotless netting applied primarily to the construction of soft pliable carrying bags in Oceania and the Americas, but also that in the two regions the techniques employed are identical in some cases and very similar in others. On the basis of all factors, ethnological, archaeological, geographical and technological, it would seem that knotless netting lends itself much better to a discussion of the possibilities of trans-Pacific influence in American cultures than do many of the traits usually given as examples of such a movement.

Knotless netting is a subject which has received very little attention in Oceania while in the New World, in spite of its widespread distribution, it has been hardly more than mentioned by a few writers for localized appearances. It is important to note that knotless netting is well suited to the development of many variations in technique. However, in so far as available material indicates, only a few of the possible arrangements seem to have been discovered, or if discovered, accepted by native peoples as patterns to be perpetuated.

Of the techniques observed in Oceania and America there seem to be three basic patterns from which all the others have been derived, and of these three, one, the Simple Loop, is fundamental to the other two. All knotless netting techniques, therefore, seem to be derived from one basic pattern. It is convenient, however, to classify the varieties under the three-fold division of Type I, Simple Loop; Type II, Loop and Twist(s); and Type III, Hourglass. Within this classification, the remaining patterns can be arranged as sub-types and varieties as in the following diagrams.

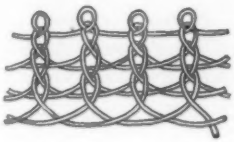
	*Type I*	Simple loop	North America, South America, Melanesia and Australia. (See table 1.)
	Type I *Variety A*	Double simple loop	Gran Chaco (Ashluslay, Nordenskiöld, p. 196, fig. 4c; Lengua, Singer).
	*Type I Variety B*	Simple loop with two inter-twining and alternating strands	Colombia (Mochila, Pueble Viejo). Singer.
	*Type I Sub-type 1 Variety A*	Simple loop interlocking with one loop on all sides	Ecuador and northeastern Peru (Yahua R. and mouth of Napo R.). Singer.
	*Type I Sub-type 1 Variety B*	Simple loop interlocking with each adjacent loop of its own row and with two loops of the adjacent rows	Nakanai district New Guinea. Graebner.



Type I
Sub-type 2
Variety A

Half-hitch around half-hitch

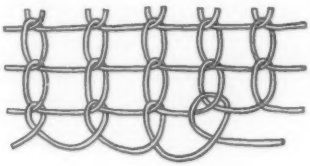
East coast of Dutch New Guinea to Finschhafen. Graebner.



Type I
Sub-type 2
Variety B

Half-hitch around half-hitch with two alternating and intertwining strands (used in belts)

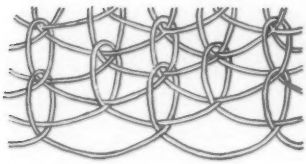
Northeastern Brazil (Patamon and Makusi) Roth, p. 440.



Type I
Sub-type 3
Variety A

Half-hitch through half-hitch

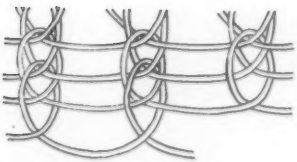
Costa Rica (Bribri, Valiente?). Skinner, pl. 5.



Type I
Sub-type 3
Variety B

Half-hitch through half-hitch with two alternating and intertwining strands

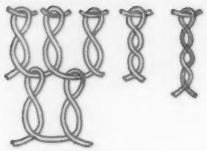
Costa Rica (Bribri). Skinner, pl. 7; North coast of New Guinea and New Britain (Baining tribe). Graebner.



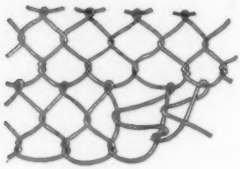
Type I
Sub-type 3
Variety C

Half-hitch through the half-hitches of two adjacent rows

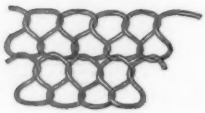
Costa Rica (Bribri). Skinner, pl. 11.



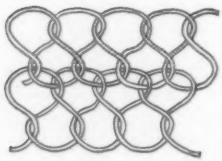
Type II — Loop and twist(s) — North America, South America, New Guinea and Australia. (See table 1.)



Type II, Sub-type 1 — Simple loop interlocking with adjacent loops on each side, thence with a double twist about itself — Venezuela. Singer.



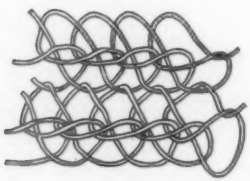
Type III — Hourglass pattern — North America, South America, Melanesia, Australia. (See table 2.)



Type III, Variety A — Hourglass interlocking with two loops of each adjacent row — New Guinea. Graebner.

Note: There is an error in the accompanying figure. The working strand should be brought forward through both loops of the preceding row rather than through only one loop.

Type III, Sub-type 1 — Figure of eight — Maya of southern and central Honduras. Thompson, pl. 11.



Type III, Sub-type 2 — Hourglass with lower loop interlocking with two adjacent loops to the right — Gran Chaco (Lengua and Charoti), Northeastern Peru (Yahua R.). Singer.

TABLE 1. SIMPLE LOOP AND LOOP AND TWIST TECHNIQUES

Bags unless otherwise indicated

	Simple loop	*Loop and twist*	
NORTH AMERICA NORTH OF CENTRAL MEXICO			
Northern Maidu (caps)	x	x	Dixon, 1905, p. 144.
Karuk		x	Harrington, J. P., pl. 11b.
Hupa	x		Goddard, pl. 6.
Pima and Papago (carrying frames)	x	x	Mason, 1902, pp. 248, 294; Kissell, p. 227, fig. 78.
Kodiak Island (gamebags)	x		Mason, 1887, pp. 210–11.
Mackenzie (muskemoots and hunting bags)	x	x	Mason, 1902, p. 249.
Dogribs (babiche wallets)	x		Mason, 1902, p. 379.
Huichol, and Tarahumare (?) (pack net and netted shield of a game)	x		Lumholtz, I: 240 (?); II: 87, 203.
*Ozark Bluff Dwellers	x		Harrington, M. R., p. 11.
*Hopewell Mounds	x	x	Mason, 1902, p. 380.
*Brewster Co. Rock Shelter, Texas	x	x	Coffin, p. 41.
*Val Verde Co., Texas	x	x	Pearce and Jackson, p. 93.
*Shumla Caves, Big Bend Area, Texas	x	x	Martin, pp. 48–49.
*Basket Maker II and III	x		Guernsey and Kidder, 1921, p. 65; Guernsey, p. 116.
*Prehistoric Pueblos I and II (?), III, IV (bags, gaming wheels, sandals, leggings, caps)	x		Kidder and Guernsey, 1919, fig. 45, pls. 34b, 46c; Guernsey, p. 116.
Montagnais-Naskapi (except in far north where hare is lacking)†	x		Dr F. G. Speck.
Têtes de Boule, Grand Lake Victoria†	x		Fieldnotes.
Eastern Cree†	x		Dr J. M. Cooper, and Miss Regina Flannery.
Eastern Cree and Northern Saulteaux†	x		Skinner, 1911, p. 35.
Saulteaux and Cree†	x		Dr A. I. Hallowell.
Slavey,† Bush Cree of Medow Lake, and Bungi (blankets)	x		Museum of the American Indian.

* Archaeological evidence.

† Blankets and garments.

	Simple loop	*Loop and twist*	
Hare, Satudene, Dogrib, Kutchin, Slavey and possibly all other northern Athabascans (blankets)			Dr C. B. Osgood; Osgood, 1933, p. 58; MS.
SOUTHERN MEXICO AND CENTRAL AMERICA			
Miskito, Twahka, Panamaka, Ulwa and neighbors (Honduras and Nicaragua)	x		Conzemius, p. 52.
Bribri (Costa Rica) and Valiente (?)	x		Skinner, p. 6, pl. 8.
Common throughout Central America	x		Mason, 1887, p. 210.
SOUTH AMERICA			
*Ica (Ocucaje)	x		O'Neale and Kroeber, p. 53, pl. 6, b.
*Arica (single and double twists)	x	x	Uhle, pp. 6, 9, 12, 32, pl. 25, 1; pl. 8, fig. 2.
*Atacama Desert (woolen hat)	x		Singer.
Jivaro	x		Kreiger, pl. 36.
Pachacamac	x		Schmidt, p. 546.
Tucano of Uaupes R. (scoop-net), Lengua, Xingu area (Kalapalu, Kuluene R. also masks), Goajira, Mochela and Santa Maria (Colombia), Venezuela	x		Singer.
Chaco, Ashluslay, Choroti, Mataco, Northwestern Brazil (Rio Negro and Rio Yapura), Botocudo, Guayaki, Ijca, Köggaba, Motilone, Araucanians, Jivaro, Oldest graves at Arica*	x		Nordenskiöld, 1919, pp. 195–202.
Western tributaries of the Rio Negro	x		Van Gennep.
Arawak, Uaupes R. (fish-net)	x		Roth, pp. 198–99, 321, pl. 48, fig. 61.
Brazil, Chiriqui	x		Mason, 1894, p. 487; 1902, p. 532 and pl. 129.
Yahgan, Alacaluf, Chono (basket style)	x		Lothrop, pp. 133–34.
Alacaluf, Chono, Onas; also Araucanians but lacking among Tehuelche	x		Cooper, 1917, p. 204; 1925, pp. 412, 416.
Patagonia, Peru, Tierra del Fuego	x		Mason, 1889, pp. 210–11.
Goajira (Colombia) (single twist)		x	Singer.
Maracaibo (Venezuela) (single twist)		x	Singer.
Fundacion, Columbia (open saddle bag		x	Singer.

	Simple loop	*Loop and twist*	
with some rows of four twists, some of three twists)			
Santa Marta, Colombia (basket-like objects, with double or triple twists)		x	Singer.
OCEANIA			
Australia: Queensland, New South Wales, Victoria, South Australia, Central Australia, North Australia	x		Davidson, p. 260.
Australia: Queensland, New South Wales, Victoria, eastern South Australia		x	*Ibid.*, p. 263.
New Guinea: Strickland R., Geelvink Bay, Goodenough Bay and hinterland, Dutch New Guinea	x		Graebner, pp. 26 *et seq.*, Davidson, p. 260.
New Guinea: Fly R., Papuan Gulf and Strickland R.		x	Davidson, p. 263.
Gilbert Islands	x		Graebner, p. 26.

TABLE 2. HOURGLASS PATTERN

Bags unless otherwise indicated

Mayas of Southern and Central British Honduras	Thompson, pl. 11.
Ashluslay, Choroti, Huari, Mataco, Tapiete, Toba, Tsirakua	Nordenskiöld, pp. 200–201; Radin, p. 938.
Ronuro tribe (Xingu area), Chaco, Chamacoco, Lengua, Mbaya. Similar (?) technique, coast of Peru (Nat. Museum, Stockholm)	Nordenskiöld, pp. 202.
Said to be lacking among Yuracare, Chimane, Guarayu, Chama, Absahuaco, Chacobo, Huanyani, Chiriguano, Chane, Araucanians, Karaja, Caingua, northwestern Brazil, Roraima country, Jivaro, Botocudo	*Ibid.*, pp. 239–40.
Huari, Bakairi and neighbors	*Ibid.*, pp. 239–40.
Choroti, Mataco, Missiones, Lengua, Kajabi (Xingu), Tupi (locality?), Mundurucu (hoop-bag), Cayapa (money pouch), French Guiana, Angayti (Paraguay-hammock), Chamacoco (also masks and hammocks), Motilone, Lengua, Guiana.	Singer.
New Guinea: Eilander R., Astrolabe Bay, Huon Gulf, Finschhafen, Collingswood Bay, Cloudy	Graebner, p. 26 *et seq.*; Davidson, p. 265.

Bay, Redscar Bay, Ope R., Geelvink Bay to northeastern New Guinea, Papuan Gulf to Massim area.

New Britain (Baining tribe) Graebner, *op. cit.*

Now a glance at the list seems sufficient to indicate that many of the patterns are unique and localized and, therefore, have no basis for comparison with appearances in other regions. Unless it will be necessary to revise this compilation when additional material becomes available, it would seem permissible to exclude from further consideration the following techniques which are found only in restricted distributions in America or in Oceania.

Type I	Variety A	Gran Chaco area
Type I	Variety B	Colombia
Type II	Sub-type 1	Venezuela
Type III	Variety A	North coast of New Guinea
Type III	Sub-type 1	British Honduras
Type III	Sub-type 2	Gran Chaco

Of the remaining varieties and sub-types there are a number which show trans-oceanic similarities but which are not identical. These include:

Type I, Sub-type 1. In this group there are two varieties, one found in South America, the other in Oceania. The former, Variety A, consists of a simple loop which interlocks with each adjacent loop in its own row and with one loop in each adjacent upper and lower row. Variety B differs only in that it interlocks with two loops instead of with one loop of the adjacent upper and lower rows. Variety A is the simpler but is not necessarily an intermediate step between the basic Simple Loop and Variety B. Granted the presence of the Simple Loop, it would seem to be an easy matter to invent either variety independently. Independent development is also indicated by their distributions. Variety A has been found only in a small area in northeastern Peru and eastern Ecuador, east of the cordillera. Variety B seems to be restricted to the Nakanai area of New Guinea. In view of the direct relationship of each to the Simple Loop, and of their localized distributions, it seems reasonable to believe that the two similar patterns are relatively recent in origin and that they have resulted from independent parallel developments from the Simple Loop within the two localities where found. Indeed, even if it will be found that both varieties are made in the two regions the theory of parallel development, to my mind, would still be the only reasonable explanation for such simple processes.

Type I, Sub-type 2. In this group there are also two varieties, A and B, the former found from the east coast of Dutch New Guinea to Finschhafen,

where it is used in bags; the latter in the Patamon-Makusi area of northeastern Amazonia, where it is employed in the manufacture of belts. Aside from the fact that in South America two alternating strands are used, the two techniques are identical in that half-hitches are taken about the half-hitches of the preceding row. Technologically, it seems rather obvious that this technique is a direct variant of the Simple Loop as well as one which might easily occur independently. The localized distributions of these two varieties would seem to indicate another example of recent parallel developments in South America and Oceania.

Type I, Sub-type 3. Sub-type 3 differs from Sub-type 2 in that the half-hitches or bights are taken through the half-hitches of the preceding row rather than around them.

In this group there are three varieties, A, B, and C, all of which are found among the Bribri of Costa Rica, but of which only B has been reported in Melanesia, where it is present along the north coast of New Guinea and among the Baining tribe of New Britain.

The most simple in appearance is Variety A which has been reported only for Costa Rica. Its relationship to and its derivation from the Simple Loop can be plainly seen. Variety C, also limited to Costa Rica, in so far as we know, seems obviously a development from Variety A. The principle of construction is the same except that the working strand is taken through the half-hitches of two adjacent rows rather than through the half-hitch of only one row.

Variety B differs from Variety A in that two alternating strands are employed to the effect that a half-hitch is taken (1) through the half-hitch of the previous row of the same strand and (2) about each pendant loop of the two adjacent rows of the alternate strand.

In spite of the fact that this technique is the same in both New Guinea and Costa Rica, there seems to be no reason for suspecting historical relationship between these two appearances. In the latter region, both B and C appear as likely derivatives from A, which in turn, it cannot be doubted, is only a slight alteration of the Simple Loop.

In Oceania, it is quite possible that B may represent a direct variation of A, although it would not be surprising to learn that A is also in use or was formerly present. In view of the restricted distribution of this technique in the two areas, further support is given the contention that convergence or parallel development is responsible for these appearances.

ALTERNATING STRANDS

The use of two alternating strands is another elaboration which is common to both Oceania and America. In the former region, it has been

reported from the north coast of New Guinea and nearby New Britain (Type I, Sub-type 3, Variety B). In America it is found in Costa Rica (I, 3, B), Colombia (I, B), and northeastern Brazil (I, 2, B). It is possible that these American appearances may be continuous in distribution and that the custom of using alternating strands has had but one origin in the New World. Such a possibility is by no means certain, however, for what we have spoken of as two alternating strands may actually be or originally may have been either two separate strands or only one strand which alternates the points of attachment as it spirals row by row. It is quite possible, therefore, for this trait to have originated in one of two different ways and to have been instigated by a variety of causes: experimentation, accident, or repair. There seems to be no reason for regarding the appearances of the use of alternating strands in the New World and Oceania as indicating historical continuity. The process is simple and apparently might occur quite naturally to knotless netters.

THE BASIC PATTERNS

We have now to consider the three basic techniques, the Simple Loop (Type I), the Loop and Twist (Type II), and the Hourglass pattern (Type III). All are found in Oceania and in America and the patterns of their construction are identical. As we have already seen, each seems to have given rise independently to certain variants in both regions. It is to these basic patterns, therefore, that we should look for any possible historical relationship between the knotless netting of the two regions.

Type III. The Hourglass pattern, it seems clear from a technological point of view, is based upon the Loop and Twist technique (Type II). In Oceania such a derivation is indicated geographically in the Australian distributions.[2] In the New World, however, the contemporary distributions, in so far as we have data, do not show this derivation so obviously. The Loop and Twist pattern occurs in several places north of Mexico and in Colombia and Venezuela, but we have no information concerning its presence in Central America or in other parts of contemporary South America. Archaeologically, however, there is material to show the relative ages of the two patterns, for the Loop and Twist technique has been recovered from a number of ancient deposits in North and South America, whereas the Hourglass technique appears only in existing cultures. At Arica, the nearest archaeological site to the contemporary appearances of the Hourglass pattern, both the Simple Loop and the Loop and Twist techniques occur in sufficient quantities to leave no doubt but that the

[2] Davidson, p. 266.

Hourglass pattern was not made at the time these pre-Incan deposits accumulated. The suspicion that the Hourglass technique may be not more than several hundred years old on the west coast of South America would seem, therefore, to have some foundation, although we are in need of additional archaeological data from other regions.

In Oceania, on the other hand, we have no stratified remains but the chronology of (1) Simple Loop, (2) Loop and Twist, and (3) Hourglass patterns appears to be established on distributional grounds as well as by technological considerations. There can be no doubt but that the Hourglass technique is the most recent of the three, but its actual age cannot be even approximately given.

In view of what seems to be a very recent appearance in western South America and a relatively recent beginning in Oceania, it would seem that the appearances of the Hourglass pattern in the two areas cannot be historically related. It would be hardly possible for influences to have emanated from one area to the other within the past millennium or 1500 years without leaving traces in other areas or without some record being incorporated in the traditions of some people between South America and Melanesia.

However, we have no right to assume that the Hourglass technique has occupied the same distribution in New Guinea during the past centuries as that noted today. Graebner has pointed out some indications of its eastward diffusion in New Guinea and there can be no doubt but that it has been carried to Australia on the south and to New Britain on the north.[3] It appears never to have reached other regions east of New Guinea.

It is quite possible that the point of origin for the Hourglass technique in Oceania is not in New Guinea, for we find the same pattern appearing occasionally as a single row in the stiff basketry in Indonesia.[4] It is impossible at present to affirm or deny the possible relationship between this appearance and the similar pattern in knotless netting, but the chance that the technique may have arisen in Indonesia must be recognized. Whether the origin was in western New Guinea or in Indonesia it will be seen that a diffusion toward America has been in process, but that only a beginning had been made and that several thousands of miles of ocean are still intervening.

In the New World no direction of diffusion has been determined. The technique is widely distributed from British Honduras to the Xingu-Gran Chaco area with appearances also in the Guianas and in Ecuador. The

[3] Graebner, p. 29; Davidson, pp. 268, 299.

[4] Lehmann, p. 191.

most intensive use at present seems to be in the Xingu-Gran Chaco region and it is possible that the few occurrences west of the Andes may have diffused from that region.

We cannot be reasonably certain that there has been only one development of the Hourglass pattern in America, for the appearance in British Honduras seems to be quite isolated from Ecuador and the Guianas, the nearest known other places where this technique now occurs. Knotless netting techniques, however, are poorly known for Central America and it is possible that the Hourglass pattern may come to light in the intermediate areas. In addition, we must not overlook the possibility that Arawak or Carib influences may be responsible for the Honduran appearance.

With a relatively slight antiquity for the Hourglass pattern suggested for both New Guinea and South America there would seem to be no reasonable basis for believing that this technique is not indigenous to both regions. Certainly there is no evidence to indicate that a trans-Pacific diffusion could be responsible. Technologically, there is no need for a diffusion theory, for a Loop and Twist basis, found in both areas, seems sufficient to explain the parallel development. On the basis of our conclusions the similarity of zigzag ornamentation appearing upon the bags of the north coast of New Guinea and those of the Gran Chaco, for which Graebner has implied a historical relationship,[5] must be regarded as fortuitous.

Type II. The Loop and Twist technique, obviously a slight variation of the Simple Loop, appears in widely separated areas in the New World, particularly in North America. So far it has not been reported for Central America, while in South America its contemporary use seems to be confined to Colombia and Venezuela. It would not be surprising, however, to find that such a simple technique is much more widespread than present evidence indicates.

Archaeologically we have seen that it occurred at Arica in South America. In North America a much greater antiquity has been determined by the finding of fragments in the Hopewell Mounds and in cave remains at Shumla Cave and in Brewster County, Texas. Since these latter remains show similarities to Basket Maker culture, a considerable antiquity is indicated.

It is possible that all these ancient appearances have diffused from a common point of origin, but it seems much more likely, in view of the simplicity of this technique and the different manners of its use, that it has been discovered in a number of places. For instance, in the Mackenzie

[5] Graebner, p. 29.

basin and among the Pima, its use seems to be more or less decorative, to relieve the otherwise monotonous series of rows of simple loops. In Colombia the peculiarities of saddle bags seem to have encouraged the development of multiple twists. In other areas it seems to have been the sole technique in a bag, as in Australia and New Guinea. It is impossible to comment upon the ancient uses since, for the most part, only fragments are available.

In the Pacific, the Loop and Twist technique is found in Australia and New Guinea and appears to have developed in the latter region, or possibly in some unknown area farther west. All facts indicate that it diffused to Australia prior to the diffusion of the Hourglass pattern to that region. In the Oceanic specimens, this technique, when used, is consistently employed throughout one bag.

We have no evidence to indicate the antiquity of the Loop and Twist technique in the Pacific. The most we can say is that it appears to have preceded the Hourglass pattern and to have developed from the Simple Loop. Presumably, however, there has been an eastward diffusion in New Guinea which never passed farther than the eastern part of the island.

From the Pacific point of view, therefore, there seems to be no indication that this technique could have diffused to America. From the American point of view we may feel quite certain that there could have been no trans-Pacific navigation early enough to have introduced this technique to the ancient cultures of Texas. Furthermore, the Simple Loop is known to have been used as early as Basket Maker II and with this background there is no need for any derivation of the Loop and Twist technique from some non-American area. Although a more or less continuous distribution would seem to indicate a unitary origin for the Loop and Twist technique in Oceania, it seems quite possible that there may have been a number of independent developments in America.

Type I. The Simple Loop, as seems clear, is the foundation for all the varieties of knotless netting considered. In Oceania, it occupies the most widespread distribution, being found throughout eastern Australia, in the regions occupied by the Loop and Twist and the Hourglass patterns, as well as in areas peripheral to them; in a large but sporadic distribution in New Guinea and also in the Gilbert Islands. There are no indications of antiquity in these regions since no archaeological remains have been discovered. However, the distributions support the theory that this basic technique has given rise to the more complex forms, and also indicate that this oldest pattern, in reaching the Gilbert Islands, has been carried farther east than any of the later varieties. Such a distribution is consistent with the material we have already surveyed which showed that knotless netting

has been in the process of invading the western Pacific and that the directions it has followed, if toward America, are only accidentally so.

In the New World, the Simple Loop is also the most widespread. Among living peoples, it is sporadically distributed from Alaska to Fuegia. Archaeologically it appears at Arica in South America and in the various deposits in North America as early as Basket Maker II.

The appearance of knotless netting in Basket Maker deposits is a fact of prime importance to our discussion, for there can be no doubt but that trans-oceanic navigation was impossible in such early times, as well as possibly for some millennia following, depending on the date finally given this culture.

There would seem to be no possibility, therefore, that there can be any trans-Pacific relationship between the appearances of the Simple Loop in America and Oceania. Indeed, knotless netting may not have been known in the Pacific at the time Basket Maker II was a living culture in North America. With the Simple Loop in use in both areas, there seems to be no reason why the different varieties could not have followed independently through processes of parallel development.

It is possible, however, that the appearances of the Simple Loop in the two areas may be historically related by way of the Asiatic continent. The influences which Asia has had upon the surrounding regions in both ethnic strains and culture are well known and it seems more than possible that knotless netting, in the form of the Simple Loop, may have been carried by migrants or diffused at an early time from group to group, on the one hand to America and on the other, to Indonesia, thence to Melanesia. Indeed these influences may have spread also in other directions, for we find the Simple Loop also employed by the Lapps[6] and by numerous tribes in Africa.[7] A more detailed study of these appearances must be made before a theory of a unitary origin for all the occurrences of the Simple Loop can be reasonably upheld, but the peripheral appearances of this basic technique support the probability that it may have originated in Asia to diffuse to America by way of Bering Strait, and to Melanesia via Indonesia.

CONCLUSIONS

Our survey of knotless netting in the New World and in the Pacific would seem to indicate again that caution must be exercised in arriving at

[6] Bag in the Buffalo Museum of Natural History.

[7] Thomas, 1924, Mongbettu shield slings; Van Rippen, pp. 90–91, Uintjes food bag of Bushmen; Hall, p. 99, fig. 36, Bapende bodice; Van Gennep, Wangoni of southeastern Africa; Lehmann, 1907, pp. 19 *et seq.*, Middle Nile, Bakuba, Bali, Haussa, Ekoi, etc.

conclusions of trans-Pacific influence in American cultures. At first glance, the numerous complexities in the knotless netting of the two areas appeared to indicate that some trans-oceanic connection was not only plausible but necessary to explain the identical appearances. Although the facts from the historic cultures of the two regions would seem to be sufficient to dispel such a theory, the most convincing evidence has been furnished by archaeology. We cannot help believing, therefore, but that were it possible to obtain some knowledge of the prehistory of other traits involved in the trans-Pacific controversy, many of them might also be found to be independently developed in the two areas or historically related during very early times via the Asiatic continent. At the same time, it must be fairly admitted that other traits may have been brought across the Pacific. Each trait should be judged on its own merits and not in accordance with some pre-conceived theory that all similarities in America and Oceania are the results either of convergence on the one hand or of trans-Pacific diffusions on the other.

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UNIVERSITY OF PENNSYLVANIA
PHILADELPHIA, PA.

BOOK REVIEWS

NORTH AND SOUTH AMERICA

Warpath. The True Story of the Fighting Sioux. Told in a Biography of Chief White Bull. STANLEY VESTAL. (xv, 291 pp., 9 pls., 3 maps. $3.00. Boston and New York: Houghton, Mifflin Co., 1934.)

Naturally stressing martial life, this biography adds interesting points to our knowledge of the subject, such as details on Western Dakota honor heraldry (pp. 24, 186), military technique including decoy tactics (pp. 56 ff., 118), and the history of a Bullet-proof society (pp. 131–144). The close contacts of the several Western Dakota groups is clearly brought out. The hero himself was the son of a Minniconjou chief and a cross-nephew of Sitting-bull of the Hunkpapa, and in the course of his life he belonged to societies of both tribes and of the Sans Arc (pp. vii, 26). Apart from warfare, there are several references to visions (e.g., pp. 12 *seq.*, 93, 109, 250), to the heyoka (pp. 13, 261 f.), a shamanistic contest (p. 94), and the Sun Dance (pp. 95, 137), performers of which are said to have used headscratchers (p. 95). A prayer to game animals in times of famine is noteworthy (p. 111), and the account of a buffalo scout's report (p. 234 f.) deserves mention. White Bull's fifteen marriages exemplify patrilocalism (pp. 88, 215), the fragility of the bond (pp. 103, 124), the tribulations due to jealousy in a polygynous household (pp. 125 ff., 213, 216), and the throwing away of wives at the Grass Dance (p. 215). An incipient trend to hereditary aristocracy is seen to mingle with the principle that merit rests in personal achievement (p. 120). Swimming is described as "dog-fashion or overhand" (p. 7), and the Crow are credited with using the bull-roarer to frighten horses (p. 107).

ROBERT H. LOWIE

UNIVERSITY OF CALIFORNIA

The Hidatsa Earthlodge. GILBERT L. WILSON (BELLA WEITZNER, editor). (Anthropological Papers, American Museum of Natural History, Vol. 33, Part 5. 80 pp., 45 figs. $1.00. New York, 1934.)

All students of Plains ethnology are familiar with the late Gilbert L. Wilson's accounts of particular phases of Hidatsa culture and will welcome this addition to the series. It is a matter for deep regret that Dr Wilson's death will prevent the bringing together of the wealth of material which he had gathered into a single complete study of this tribe. The present work maintains the high standard of the earlier reports. It is unquestionably the most complete account of the plan, construction and internal arrangement of earth lodges which has so far been published. It also contains a unique account of the founding of a new village, the marking out of the site, and the selection of places for lodges and the construction of the village stockade. The work will be of interest not only to ethnologists but to all archaeologists working in regions where earth lodges and village fortifications are found.

RALPH LINTON

UNIVERSITY OF WISCONSIN

Ethnology of the Nisenan. RALPH L. BEALS. (University of California Publications in American Archaeology and Ethnology, Vol. 31, No. 6, pp. 335–414, 1933.)

This report on the Nisenan or Southern Maidu is concerned mainly with the hill and mountain culture which differs markedly from that of the Valley Nisenan. The culture is in an extreme state of decay, for these people suffered heavily during the American occupation of California and most of the old ways were soon abandoned. Dr Beals' work is comprehensive but necessarily sketchy on those points where adequate information cannot be obtained. Considering the present state of Nisenan culture, his account is probably as extensive as will ever be possible. Two characteristics of the report which deserve special mention are the use of a number of informants and, more important, the attention paid to regional diversity within the area. Too often information obtained in one community is assumed to apply to all communities within a tribal area so that a false picture of trait distribution is obtained. The study of variations from community to community in a tribal culture will no doubt assume much more importance in the future than it has so far been accorded, for such study illustrates in a most definite way the tendency of culture to modification.

FORREST E. CLEMENTS

UNIVERSITY OF OKLAHOMA

Pomo Myths. S. A. BARRETT. (Bulletin, Public Museum of the City of Milwaukee, Vol. 15. 608 pp. $5.00. Milwaukee: Public Museum, 1933.)

Wintu Myths. CORA DU BOIS AND DOROTHY DEMETRACOPOULOU. (University of California Publications in American Archaeology and Ethnology, Vol. 28, No. 5. 124 pp. $1.25. Berkeley: University of California Press, 1931.)

These two folktale collections are major contributions to the mythology of northern California. The first comprises one hundred and eight tales representing Central, Eastern, and Northern Pomo dialectic groups. The author has made his collection more than a mere record by adding apparatus to facilitate its use: a classification of the myths, introductory definitions of local religious concepts and supernatural beings, abstracts, catchword guide, glossary, and an all-inclusive index. Dr Barrett's tales and relevant ethnographic notes were collected twenty years ago. After correlating his findings with more recent data on Pomo religion, he concludes that the master-creator, Madumda, and Coyote are the same being, although Madumda figures but slightly in the tales (pp. 15–18). Tales of Creation, World Fire, Deluge, Ascent to Sky, Sun and Journeys to Sun's Abode, Theft of Fire, Supernatural Beings, Tricksters, Bear and Deer, and Origin of Death are compared on their major points with those from other tribes of central California (pp. 465–91) with the result that Kroeber's regional division of Californian mythology into a north central and south central group is wholly corroborated (pp. 11–13, 491–93).

Although the tales are rendered in chaste English, thereby precluding a consider-

ation of their literary style, their incidental structure is intact and they offer, with their adjuvant apparatus, an ideal group of tales for study. Immediate differences between dialectic groups, the relation of these differences to neighboring mythologies, wide relations of Pomo mythology in general, and the influence of preferred themes upon the local tale-type can be demonstrated by this admirable material.

The seventy-five Wintu myths were collected by an ethnographer and a linguist. While comparative notes of local range accompany the tales the authors omit all comment on their cultural relationships. The tales taken in text have been given in a style which happily preserves the flavor of the original. An able consideration of Wintu literary style and stability based on this collection has been published elsewhere by the same authors.[1]

Since this work was not used by Dr Barrett a brief comparison of salient features in these Pomo and Wintu myths may be to the point here. Creation: Pomo, Coyote and Wolf create men, animals, institute customs; Wintu, absent.[2] Flood: Pomo, activities of animals who save themselves on mountain top; Wintu, detailed activities of certain people just before the flood. Transformation of first people into fauna: Pomo, strong; Wintu, weak. Thefts: Pomo, of daylight, fire; Wintu, of daylight, fire, obsidian, dentalia, food seeds. Contests: Pomo, against evil father-in-law, Sun, cannibalistic bird, Thunder, by heat, shooting opponent; Wintu, against Sun, evil father-in-law, by variety of minor tests, gambling, talking, hunting. Coyote: Pomo, creator-culture-hero-transformer, and dupe; Wintu, trickster and dupe. Important characters: Pomo, Coyote, Wolf, Falcon, Sun, Cannibalistic Bird, Water Monster, Obsidian-man; Wintu, Coyote, Strong Dwarf, Loon Woman, Ogress, Olelbis. Ritual numbers: Pomo, 4, 2; Wintu, 5, 10.

General likenesses between the mythologies are those characteristic of the north central California folktale area; the contrasts are preferences for certain characters and emphasis on different topics.

A. H. GAYTON

NEW HAVEN, CONNECTICUT

Two Paiute Autobiographies. JULIAN H. STEWARD. (University of California Publications in American Archaeology and Ethnology, Vol. 33, No. 5, pp. 423–38, 1934.)

Ethnography of the Owens Valley Paiute. JULIAN H. STEWARD. (Same series, Vol. 33, No. 3, pp. 233–350, 1933.)

Ethnography of the Surprise Valley Paiute. ISABEL T. KELLY. (Same series, Vol. 31, No. 3, pp. 67–210, 1932.)

The two Paiute autobiographies presented by Dr Steward are of interest in that they illustrate this culture in actual operation and show the way in which two en-

[1] A Study of Wintu Mythology (Journal of American Folk-lore, Vol. 45, 1932), pp. 373–500.

[2] Though given by Jeremiah Curtin, Creation Myths of Primitive America (Boston, 1898), pp. 243–63.

tirely different personalities reacted to their cultural environment. Their chief value lies in the fact that they contain much subjective data regarding individual variations in psychological attitudes and cultural values. Such data are not often found in the usual ethnographic account.

The second and longer publication of Dr Steward is an orthodox description of the culture of the old Eastern Mono, a tribal designation which is shown to be inaccurate, for their relationships are with the Paiute rather than the Mono. The report is comprehensive, well-written, and covers all the main features of Owens Valley Paiute culture. There are a number of illustrations and two excellent maps.

Miss Kelly's work is likewise an orthodox ethnographic account and deals with the Northern Paiute or Paviotso. The data on material culture are very full, while the information on social and political organization is as comprehensive as possible though not extensive. This last is probably due to the lack of complexity in social organization. The account of magic and religion presents the important phases of the subject but the author feels that much is yet to be learned. Information on religion is difficult to obtain because of native reluctance to discuss such esoteric matters. The work is illustrated with a number of drawings and plates.

Like all the publications in this series, these three dealing with the Paiute are thoroughly condensed so that although the longest numbers only a little more than one hundred forty pages, they contain a remarkable amount of information. Their publication fills a considerable gap in existing knowledge of Basin ethnography.

FORREST E. CLEMENTS

UNIVERSITY OF OKLAHOMA

Archaeology of Santa Marta Colombia. The Tairona Culture. Part 1, Report on Field Work. J. ALDEN MASON. (Anthropological Series, Field Museum of Natural History, Vol. 20, No. 1. 130 pp., 64 pls., 2 maps. Chicago: Field Museum, 1931.)

This very interesting publication is the first of an exhaustive report which is planned to appear in three parts. The second and third, which are to appear later, will be respectively "the description of the material" and "the scientific results and deductions." We are thus, in Part 1, furnished with a detailed report of the field work of the expedition which remained in this special locality in the northern Colombian coastal region for a full year. The particular objective of the expedition was a careful scientific study of the cultural remains of the long-extinct Tairona Indians, representative of one of the more advanced aboriginal cultures of America.

In a pleasing narrative style the author first takes us from one to another of the various sites visited along the coast and in the adjacent mountains. We are introduced to the sundry vicissitudes of work in this tropical land while we see brought to light architectural, engineering and other features, such as "paved roads, bridges, walls, covered drains, staircases, circular sites, and stone-lined graves," together with incised petroglyphs, beautifully formed and decorated pottery, and a multitude of other tangible evidences of a once dense population of high culture.

Then follows a very careful and detailed "description of the localities investigated." Each locality is taken up and fully described; its location, topography and environmental setting, and history being given. Then follow in full detail the archaeological features encountered by the expedition: architectural, engineering and mortuary features, artifacts of many kinds, including objects of gold and semi-precious stones, as well as implements of stone, bone, shell and the like, and pottery of mortuary and utilitarian types. Full attention is given to osteological remains and the circumstances of their placement. In short no detail is omitted from the description of each locality in which any work was done.

The paper is excellently illustrated with photogravure plates and many plats of villages and drawings of special features and objects.

It is, in fact, throughout a most careful and thorough report on the field work carried on by the expedition and forms an excellent preliminary for parts two and three which we shall await with much interest.

S. A. BARRETT

MILWAUKEE PUBLIC MUSEUM

AFRICA

Myths and Legends of the Bantu. ALICE WERNER. (335 pp. 15s. London: George W. Harrap and Co., 1933.)

Dr Alice Werner, whose contribution of the African volume to "The Mythology of All Races" has already shown her knowledge of the folklore of the whole continent, has in this new work confined herself to the Bantu-speaking tribes of central and south Africa. These peoples she presents to the reader not only with understanding but with the affection that comes from long and close association.

The book is designed for the general reader. A clarification of the inter-relation of the various African tribes and an account of their habitat and customs prepares the way for the main part of the book, the myths and legends. These are arranged into logical groups, beginning with tales of the gods and the other world and proceeding through hero adventures to ogre and animal stories. These tales have all been retold by the author and joined by a running commentary.

For the general reader this method undoubtedly adds to the interest of the book, as do the frequent pictures of scenes suggested by the stories. Though the folklorist will wish that the stories had been more definitely separated from one another so as to indicate the exact form of the tale type, he must realize that in a popular compilation such as this, he can hardly expect such formal separation any more than he may look for completeness in the list of types or for any attempt at comparative notes. He can at least be particularly grateful for the fullness of the bibliography and index and for the attractive printing and binding of the volume.

STITH THOMPSON

INDIANA UNIVERSITY

Fish-hooks in Africa and their Distribution. S. LAGERCRANTZ. (Riksmuseets Etnografiska Avdelning. Smärre Meddelanden, No. 12. 39 pp., 14 figs. Stockholm, 1934.)

This short paper, the twelfth of the whole series and the tenth written in English on technological subjects, is published by the Swedish museum. It shows the distribution of fishhooks in the African continent, and is an important contribution to ethnographical literature. The author supplemented this paper by another on fishhooks during the recent anthropological congress in London.

From a study of the distribution of fishhooks Lagercrantz comes to the conclusion that, as there is no archaeological evidence of fishhooks in Africa (with the exception of Egypt, the Mediterranean coast, and the Canary Islands), they are not indigenous to the continent. He sums up by saying (p. 31):

1. With exception for East-Africa and Congo where fish-hooks are indigenous, they are brought to Africa by European and African traders.
2. In Western Africa can be made out an area where the Hausa have spread European (?) hooks to certain tribes, and
3. crocodile hooks were formed upon the model of fish-hooks.

On the whole the paper is an excellent summary of all that is known of fishhooks in Africa. It also contains fourteen figures, mostly of fishhooks in different European museums and a map showing the distribution of gorges and round hooks in Africa. It is to be hoped that similar papers will be published about other continents as well. The present reviewer has collected materials dealing with North American fishhooks in European museums which he expects to publish shortly.

BIREN BONNERJEA

BUDAPEST, HUNGARY

Die Völkerstämme im Norden von Liberia. PAUL GERMANN. (141 pp., 24 figs., 37 pls., chart. 7 Mk. Leipzig: R. Voigtländer, 1933.)

This is a report of results gained on an expedition of about three months' duration: a sketch of the ethnography of certain tribes in northern Liberia. The brevity of time and the obligation of gathering ethnological specimens were no doubt partly responsible for the sketchiness of the study, which is to be regretted. The ethnology of Liberia is to a great extent still unknown. The older literature is concerned mainly with the coast population, especially the Vai and Mende on or near the western shoreline. Lately Westermann has published a detailed study of the Kpelle (Kpessi), a large group stretching northward from the center of the country.[1] Dr Germann's material is on the neighboring northern tribes of the Gbande, Toma or Buzi, and to a certain extent the Gissi (Kissi). Some rather scanty information was available previously on the congeners of these tribes in French territory where Mandingo influence is felt more heavily. This influence is not negligible on the Liberian side either; Mandingo ("Comande") are found in

[1] D. Westermann, Die Kpelle: Ein Negerstamm in Liberia (Göttingen-Leipzig, 1921).

many villages, forming privileged warrior groups, or as priests or leather workers; and they traverse the countryside as itinerant traders and bards.

Excepting the Gissi, a more recent intrusion into Liberia, the tribes under discussion are linguistically and culturally closely allied to Westermann's Kpelle. As Westermann's study concentrates especially on social organization and religion, Dr Germann's material complements it very well; its most complete portions are those dealing with material culture and techniques. Still, one would like to have had more specific and clear-cut information on some aspects of social organization. The sib system is treated within a meager two pages, leaving most of even the fundamental questions somewhat suspended. As Westermann's work is followed rather closely, it is at times doubtful whether the author's statement is merely a quotation from the former on the Kpelle or is a matching of Kpelle data by those from his own tribes. This becomes especially disappointing when the sib system is described. Westermann suggests that under external influence an older matrilineal system in the region is and has long been leaning very gradually toward a patrilineal system.[2] Dr Germann suggests the same thing with the same specific data, and more strongly put (p. 72). It is not clear, however, whether he had found independent confirmation or merely accepted Westermann's data as applying to his tribes also.

A sizable collection of stories, chiefly from the Gbande, closes the volume. In these, two of the West African tricksters figure side by side, the water chevrotain and the spider. Many examples are of the riddle-story type in which the listener decides at the end which of the actors deserves the chief credit or reward. Some of the stories that seem to call for an etiological or moralizing ending, or for a closing proverb, end somewhat up in the air. This may be because most of the story material was collected from young boys temporarily at the mission school.

The descriptions of techniques and material objects are excellent and well illustrated, and the work is well rounded, except for the points already raised. The more reason for the reader to regret that more time could not be spent by the author in enlarging our knowledge of one of the regions in Africa on which any information is most welcome.

GEORGE HERZOG

YALE UNIVERSITY

Essai sur la grammaire Banda. CHARLES TISSERANT. (Travaux et Mémoires de l'Institut d'Ethnologie, Vol. 13. 185 pp. 56 fr. 25. Paris: Institut d'Ethnologie, 1930.)

Dictionnaire Banda-Français. CHARLES TISSERANT. (Same series, Vol. 14. 611 pp. 137 fr. 50. 1931.)

The Phonetic and Tonal Structure of Efik. IDA C. WARD. (xiv, 186 pp., 22 figs., kymograph tracings, texts. 8s6d. Cambridge: W. Heffer and Sons, 1933.)

[2] *Op. cit.* pp. 55–56; J. L. Sibley and D. Westermann, Liberia—Old and New (New York, 1928), pp. 115–16.

In many languages of the African continent, "tone" or musical pitch is an element so fundamental that its violation would keep the speaker from being understood. The average linguist, however, is not trained to perceive musical tone, nor is he necessarily equipped with an accurate musical ear. Thus he finds himself in a situation not unknown to the anthropologist—lacking in a specific technic and at the mercy of his deficiency or of the "expert" he calls in.

The first case is illustrated in Father Tisserant's study of the Banda dialects, found north of the Ubangi River. His essay shows serious work, although the categories of the conventional European grammar loom a little too large to make one feel completely comfortable. The author pleads a deficient ear and in the grammar restricts tonal indication to places where a difference of grammatical meaning can be explained only by a difference of tone. In the dictionary all tones are marked as heard. A perusal of it shows that so very few words occur either on high or low, as against the overwhelming mass of middle tones, that one fears the markings are not always correct. The procedure followed in the grammar is dangerous as it entails selecting what is functionally important in material which may not have been identified correctly. Thus, however unintentionally, a specious certainty is conveyed.

The function of tone in Efik—a language of the Cross-River region, West Africa—is the chief subject of Miss Ward's study, offered modestly, with no linguistic pretensions. Her background, then, is presumably phonetic and musical, and not originally in the African linguistic field. Certain points are of interest as showing the disadvantages of the expert unacquainted with the setting. For example, consonantal length is represented by writing the sound symbol twice if a nasal prefix is followed by a word beginning with the same nasal. Vocalic length on the other hand is not written because it is "not significant." "Some vowels, however, strike the ear as longer than others, and should be so pronounced." "A vowel on a rising or a falling tone is generally longer than on a high or low level tone" (p. 29). What seems at first merely inconsistently written turns out to be wrongly conceived. Just as, before, an objectively long element was conceptually not a unit but a merging of two, so the "long vowels" may represent some such process; a rising tone must be looked upon as low tone plus high tone. Whether "length" is functional or not cannot be legislated. This leads to the essential limitation of the study: while the tones are marked with a minuteness almost too exact to be meaningful, we do not get an understanding of the system as such. A number of patterns are described and their grammatical meanings ascertained, a great advance over older studies of the language. But one has the feeling that if an out-and-out linguist could collaborate with the author, something more integrated would emerge.

From these comments, two conclusions follow: specifically, that musical tone should by all means be marked, and consistently, in languages where it functions significantly; and in general, that the outside expert must be either intimately acquainted with the setting or context of the material and with the technic of that setting, or must collaborate with one who has this intimacy.

GEORGE HERZOG

YALE UNIVERSITY

OCEANIA

The Manobos of Mindanao. JOHN M. GARVAN. (Memoirs of the National Academy of Sciences, Vol. 23, First Memoir. $1.00. Washington: Government Printing Office, 1931.)

This volume is the result of a residence of nearly four years among the Manobo, a little known pagan tribe of south central Mindanao in the Philippines. During his stay the author acquired a knowledge of the language and entered fully into the life of the people. As a result he is able to furnish a most intimate picture of the culture, as well as the natives' views concerning their own activities.

The tribe is broken up into many small divisions which the author calls clans, although they appear to be simply groupings of families around noted warriors. Since such leaders are in communication with and under the protection of the warrior deities they possess great prestige, yet they have no real authority, they receive no tribute, and exact no services from their fellows. They are called upon to settle disputes, but their decisions must be according to the customary law—which in turn is closely linked with religious beliefs. The desire of the younger men to achieve distinction as warriors, feuds between the "clans" and hostile relations with surrounding tribes have resulted in a constant state of warfare and a lack of security which is reflected in every phase of the life.

While they are poor in material possessions and appear backward in many respects, they have well defined ideas of property, of contract, debt and liability. Religious beliefs and practices, while not organized, are surprisingly uniform and still hold full sway over the lives of the tribesmen.

In general the Manobo correspond rather closely to the other tribes of southern and eastern Mindanao. This is particularly true in material culture and religious practices, even the names of many of the deities being held in common.

One portion of the volume is devoted to a discussion of the neighboring tribes and their relationship to the Manobo. Writings of several Spanish missionaries of forty or more years ago are cited but no mention is made of recent ethnological publications which deal with the tribes in question. Reference to these later studies would have made unnecessary the rather vague speculations on physical type and tribal relationships found in the first chapter.

Even though the comparative data is inadequate and the volume is singularly lacking in citing the literature of the field, the study is a distinct contribution to our knowledge of Philippine ethnology. On the purely descriptive side, Mr Garvan has furnished an excellent account of native life, amplified by personal experience and opinions furnished by the people themselves.

FAY-COOPER COLE

UNIVERSITY OF CHICAGO

Archaeology of Oahu. J. GILBERT MCALLISTER. (Bulletin, Bernice P. Bishop Museum, 104. 201 pp., 67 figs., 12 pls. Honolulu: Bishop Museum, 1933.)

This report is one of a series covering the archaeology of the various islands in the Hawaiian group. Although it deals exclusively with Oahu, even omitting com-

parisons with the rest of the group, it will be of interest to all students of Hawaiian culture. In Hawaii, no clear line can be drawn between archaeology and ethnology. Practically all the implements found in archaeological work are of types still in use at the beginning of the historic period while many of the ruins were actively functioning temples at the time of Cook's visit. In the case of the smaller shrines numerous beliefs and practices are still current. Dr McAllister has covered the literature with unusual thoroughness and has gathered a good deal of new material from local informants, making the book a real addition to our knowledge of both past and present Hawaiian culture. He has also succeeded in making it unusually readable for a work of this sort. Routine descriptions of objects and sites are enlivened by legends and historic incidents and there are occasional flashes of humor which in no way detract from the accuracy and thoroughness of the book as a scientific report.

RALPH LINTON

UNIVERSITY OF WISCONSIN

Archaeology of Kahoolawe. J. GILBERT MCALLISTER. (Bulletin, Bernice P. Bishop Museum, 115. 61 pp., 5 pls., 25 figs. Honolulu: Bishop Museum, 1933.)

Stone Remains in the Society Islands. KENNETH P. EMORY. (Same series, 116. 182 pp., 20 pls., 133 figs., 1933.)

Tuamotuan Stone Structures. KENNETH P. EMORY. (Same series, 118. 78 pp., 10 pls., 71 figs., 1934.)

McAllister's report on the smallest of the inhabited Hawaiian islands is based upon data collected by Stokes in 1913, upon a detailed study of materials collected at that time, and upon a week's field survey. Archaeological remains encountered on the island include heiaus, fishing shrines, house foundations, camp sites, burial places, and miscellaneous features associated with these. The sites produced such culture-indicative materials as are consistent with a simple, primitive, fishing village type of life. A particularly illuminating series of specimens illustrating the manufacture of bone fishhooks was discovered, supplying previously unknown details.

All the evidence indicates a small, semi-permanent population, strictly Hawaiian of the time of the discovery. However, the cultural manifestations are limited, lacking many features characteristic for the more densely populated islands, and suggest a fishing industry rather than a well-rounded culture. The author logically postulates that the early inhabitants were transient fishermen, hampered in any broader cultural expression by local arid conditions.

The report exhibits a clear simplicity in the presentation of facts, and a quality of critical judgement in conclusive treatment, that promise well for the future work of the author.

Emory's two reports, on stone structures in the Society and Tuamotuan groups respectively, are based largely upon personally collected data, although the author

takes full advantage of all previously reported facts pertinent to his subject. Three-fourths of the text in these reports are devoted to detailed descriptions of archaeological features, with directly associated historical and theoretical comments. Two hundred and fifty sites in the Society Islands and ninety-three in the Tuamotus were examined.

The outstanding structures in both groups are maraes. In the Leeward Islands of the Society group, these are generally paved courts with a sacred platform (ahu) at one end. In the coastal regions of the Windward Islands the maraes are relatively large and equipped with stepped ahu. Inland in Tahiti there are three types of maraes: (1) simple shrines without ahu; (2) platforms with a type of ahu surmounted by three upright back-rests; (3) enclosures with ahu surmounted by a single back-rest. The Tuamotuan maraes are basically like the Leeward Island structures of the Society group, although generally smaller and tending towards even greater simplicity. A greater number of back-rests characterize the ahu platforms. Exceptional are the maraes of some of the most eastern of the Tuamotus, which are larger and more similar to the archaic maraes of Necker Island.

There is a fundamental cultural difference between the type of stone work dominant in the Windward Islands of the Society group, characterized by small dressed stones and superior stone shaping and fitting, and that most typical for the Leeward Islands and the Tuamotus, where a megalithic type of masonry prevails.

Emory concludes that maraes "probably" came into Polynesia from, or by way of, Micronesia. The Tuamotuan marae is the prototype of the Society Islands forms. Similar structures in the Marquesas were probably introduced from the Society Islands. The marae, so named, is not found in Hawaii proper. It is a sacred place in southeastern Polynesia, whereas in southwestern Polynesia it is a place of general assembly. The sacred marae of Tahiti is probably the result of a merging of the marae, or place of assembly, and the sacred ahu, accomplished after the separation of the Society islanders from the Polynesian migrants to Hawaii and southwestern Polynesia. The Hawaiian heiau, when equipped with a stone enclosure wall, is not unlike the marae of southeastern Polynesia, structurally and functionally, and there is traditional evidence that two of the enclosed heiaus were built under the influence of Tahitian immigrants in about the thirteenth century. The image platforms of Easter Island are basically like the maraes of the easternmost Tuamotus.

Archery platforms, house sites, fortifications, wier fish traps, petroglyphs, and burial mounds are also described and discussed.

These reports not only reflect careful attention to facts encountered in the field, where much time and hard labor must have been required to cover the sites described, but also exhibit a thorough understanding of the problems and a comprehensive knowledge of culturally related provinces in Oceania. These factors lend important value to Emory's work. It is the reviewer's reaction, however, that the author is inclined to see the phenomena of other Polynesian divisions in terms of Society Islands phenomena, and so to over-accent the latter province as a center of one-way diffusion. Data are submitted in support of a number of interesting theories

of diffusion, but the extent to which these data may have been selected for that purpose remains a pertinent question in the reader's mind.

W. C. McKern

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PREHISTORY AND PHYSICAL ANTHROPOLOGY

Paleolithic Man and the Nile Valley in Nubia and Upper Egypt. A Study of the Region During Pliocene and Pleistocene Times. K. S. Sandford and W. J. Arkell. (Prehistoric Survey of Egypt and Western Asia, Vol. 2. [James Henry Breasted, ed.] Quarto, 92 pp., 21 figs., 43 pls., map. $6.00. Chicago: University of Chicago Press, 1933.)

The first volume of this series (see review, American Anthropologist, Vol. 32: 677–78) dealt with the Faiyum basin and the adjacent west side of the Nile valley a short distance above Cairo, or more precisely, 125 to 175 miles up the river from the Mediterranean. The present volume is a supplementary report on another segment of the Nile trough, extending from Luxor southward beyond the Egyptian border as far as the third or Semnah cataract in Sudan, or more strictly, Nubia; i.e., between points approximately 425 and 775 miles upstream. As before, the aim is to correlate early human activities with definite geological events, an undertaking to which the specially equipped authors have devoted no less than five field seasons, the present report representing surveys conducted in 1926–7 and 1929–30, supplemented by final checkups in 1930–31.

Fully two thirds of the verbal report is devoted to the geological and topographical history of the Nile valley, the remaining portion being divided between description of selected artifacts found *in situ* and description of typical local petroglyphs. The geologic introduction begins with considerations of the ancient igneous (granitic) and later metamorphic (sandstone, shale, limestone) formations across which the Nile has cut its deep channel. It next demonstrates the existence during Pliocene times of a Mediterranean gulf extending up the Nile trough for a distance of more than 500 miles, as indicated by the presence along the valley sides of breccias and conglomerates ranging up to 180 meters above the present sea level. Beyond the head of this gulf, near Kom Ombo, no Pliocene formations occur, the well-marked fresh-water gravel terraces there present being regarded as of much later origin. The older or upper series of these terraces, considered as of Plio-Pleistocene date, range at levels approximately 300, 200, and 150 feet above the present Nile valley floor; while the younger or lower definitely Pleistocene terraces occur at elevations respectively 100, 50, 30, and 10 feet above the same valley floor, with which all are uniformly parallel for several hundred miles. These extensive gravel terraces are taken to indicate a strong Nile current, or in other words a relatively heavy rainfall, both local and distant. But, following the last or ten foot gravel terrace, a diminution in precipitation—foreshadowing the approach of modern desert conditions—is indicated from below the second cataract northward by the mantling accumulation exclusively of fine silt. This silt phase—still in progress—was at first characterized

by prolonged widespread deposition and later on, as at present, by slow erosion of the relatively old, high lying silts on the one hand and the continuing deposition of new silts on the valley floor on the other. Advancing desert conditions have finally resulted in sand dunes which partially mantle all formations on the west bank of the Nile. All of this highly interesting local bit of earth history is necessarily technical and in some of its details beyond the full comprehension of the reviewer. In the way of foolish questions, however, the mere archaeologist is left puzzled as to the essential mechanism of terrace building. He wonders how Pleistocene and Plio-Pleistocene terraces are distinguished—by the presence or absence of implements, perhaps? He would like to know why the upper surface limit of the older silt deposit does not parallel the valley floor as do the gravel terraces but instead rises gradually southward, from 18 feet at Luxor to 100 feet at the second cataract. Lastly, he is particularly anxious to learn how deep in the valley floor silts Neolithic artifacts occur; in short, whether or not Breasted's 1919 estimate of 20,000 years still holds.

Turning to the artifacts themselves, the all-important point about them is that their geologic occurrence here in distant Upper Egypt and beyond conforms in all major respects to the earlier Faiyum Divide findings. Protracted search in the Pliocene and Plio-Pleistocene formations has yielded no positive *in situ* results. In consequence of this the authors boldly discard Schweinfurth's collection of supposed Pliocene Eoliths as obviously not Pliocene because, for one thing, they were partly true Paleoliths. The oldest of the seven or more lateral gravel platforms to furnish unquestionable artifacts of Prechellean and Chellean coup-de-poing types is the 100 foot terrace, considered as of Pleistocene date. The 50 foot terrace supplies typical Acheulian implements, as well as rolled Chellean forms derived from the terrace above. The 30 foot terrace yields an Early Mousterian technique, while the 10 foot terrace is characterized by a fully developed Mousterian inventory. Finally, the superposed high-level silts inclose and are overlaid by a rather characterless flint industry which changes gradually in both technique and implement forms from the typical Mousterian of the 10 foot terrace to a microlithic industry suggestive of the Late Capsian of North Africa and the Azilian-Tardenoisian of western Europe. This early silt phase culture stage is locally distinguished as the Sebilian industrial period and corresponds chronologically, and to some extent technologically, to the Upper Paleolithic of Europe. Its remains are significantly absent from the high desert surface, but in the valley (besides occurring *in situ*) are found superficially as workshops and even as shellheaps, which latter demonstrate their relative antiquity by the presence of bones of at least two extinct mammals.

The authors have made a studied selection from their artifact discoveries, which has been illustrated in natural size as well as described and discussed in a distinctly penetrating and illuminating manner. One could wish, however, that the generous allowance of plates had been filled with more illustrations, even if of reduced size, so that the reading archaeologist might have had a chance to size up the successive industries for himself. Also it is regrettable that in the case of the two plates devoted to the Middle and Upper Sebilian remains more space is devoted to mere cores and

flakes than to actual implements, provided of course that the latter were present in larger numbers. Lastly, the petroglyphs, separable into several successive groups of which the oldest bears some resemblance to Bushman work, are also described and figured sufficiently, it is to be hoped, to encourage someone to give the subject special attention.

All in all the report strikes the reviewer as a thoroughgoing performance of the highest importance. It has been known for a long time that the high desert surface in certain places on both sides of the Nile is littered with flint implements of European Lower as well as Middle Paleolithic types and which exhibit widely varying degrees of patination. It has been known also, for at least fifteen years, that the degree of patination correlates directly with the supposed typological evolution of implement forms and that therefore Egypt's early flint industries most likely underwent essentially the same changes as those established for western Europe. Now, finally, in the present report we have our theoretic chronology stratigraphically demonstrated and the local antiquity of man at least tentatively limited to the Pleistocene geological period.

N. C. NELSON

AMERICAN MUSEUM OF NATURAL HISTORY

An Introduction to the Anthropology of the Near East. C. U. ARIËNS KAPPERS. With a chapter on Near Eastern Bloodgroups by Leland W. Parr. (vi, 200 pp., 94 figs., 2 tables, 1 chart. $9.00. Amsterdam: N. V. Noord-Hollandische Uitgeversmaatschappij, 1934.)

To term this monograph an "Introduction" is but to reflect the innate modesty of the author. It is far more than an introduction: it is a comprehensive survey of all that is known of the physical (cranio-cephalic) types of the Near East, both historic and modern. Much of the latter data represents the original research of the author and his colleagues, Dr and Mrs H. Krischner, who have measured 2500 and 2700 individuals, respectively.

The study is based almost solely upon three head measurements—length, breadth and height—and their derived indices. The author regards the cephalic index as of paramount importance in tracing racial affinities, defending his thesis by pointing out that on fragmentary material length and breadth measurements are often the only ones available. A further defence is quoted from Morant who in an evaluation of 31 craniometric measurements concluded that six, including length, breadth, height and their indices, were of supreme diagnostic value. Professor Kappers is quick to point out, however, that the comparative study of craniometric distribution must be limited to a definitely circumscribed area. His handling of the data is based upon the use of the frequency curve; this gives not only the average, but frequencies and the range of the distribution. This method elucidates diverse racial elements by means of a bimodal or even polymodal curve.

The early part of the volume is given over to a discussion of the Armenians and others of Armenoid affinities. The Armenians are found to present two peaks in the

cephalic index curve: one at 83–4 and the other at 86–7. This characteristic is dominant and is established as the criterion of relationship. Thus the Khaldeans with peaks at 83 and 86, the Assyrians (Aissori) with peaks at 84 and 87, the Christian "Arabs" with peaks at 84 and 87, and the Lebanese with peaks at 84 and 87 (although there is an extraneous element represented by a peak at 80–1) are all definitely linked up with Armenoids. Similarly the "hyperbrachycephalics among the Turks are of Armenoid . . . descent."

The skeletal material from Alishar (Boghaz Keui, the ancient Hittite capitol Kheta) revealed dolichocephalic and brachycelpahic skulls neither of which type was similar to the "Hittites" of the monuments: the hypsicephalic planocciptal type represented by the Armenians. Professor Kappers explains this apparent dilemma by stating that "the so-called Hittite pictures represent the older and numerically larger Subarean component of the Hittite empire of Ramses II's time." The dolichocephalic skulls of Alishar IV are stated to "have an Indo-Aryan type." Some of the brachycephalic skulls of Alishar II–III are considered Armenoid, notwithstanding that the brachycephaly is due to increased breadth rather than decreased length.

Professor Kappers concludes that

> the Armenians, Khaldeans, Aissori and some other groups are closely related to Central Asiatic peoples of the Altai-ugrian or Turki stock. As several of these peoples are related to Central Mongolians and may have Mongolian facial features, this conclusion agrees with Dudley Buxton's statement that the Central Mongolians are connected with the Armenoid race. I would propose to group them together as the "*Central Asiatic Race.*"

The author then considers the thinning out of hyperbrachycephaly as Palestine and Syria are approached. This is due, probably, to intermixture. The Jews may be cited as an example when it is observed that they "are a mixture of the brachycephalic Subarean and mesocephalic Asiatic mediterranean types." Professor Kappers is quick to recognize, however, that the Jewish head-form will differ with the surrounding physical type.

The antiquity—as well as the ultimate origin—of dolicocephaly in the Near East is clearly hinted when the author identifies as similar Alishar IV, Hissarlik III, Ur, and Punjabi types. These long-heads are the "Caspian people" who "presented an ancient Indo-Aryan stock." In general Indo-European, Indo-Aryan, Caspian, and Mediterranean are used synonymously, although Professor Kappers insists that it is necessary to discriminate between the *ancient* and the *modern* Mediterraneans. The former, with peaks at 72–73 and 75–76, are either "Indo-Aryans or a Veddoid people." The latter are "prevailingly mesocephalic."

Greece and Crete are considered to both represent Egyptian influence; Greece in dynastic times, Crete in predynastic and early dynastic times. In addition a mesocephalic Scythian element is traceable in both populations. A final subbrachycephalic Caucasian (Slav) element is observed in certain districts of the Peloponnesos.

The racial structure of the Near East is thus reared almost solely upon the cephalic index, i.e., proportions rather than absolute measurements are the criteria of relationship. Professor Kappers does, however, permit a distinction between the short-skull brachycephaly of the Armenians and the broad-skull brachycephaly of other round-headed groups. Insofar as he does this, absolute dimensions receive consideration. Smallness of skull is explained by environmental factors. Thus the small head of the low caste Chuhra is contrasted with the "better situated Rajputs;" the very small-headed hyperbrachycephals of South Arabia measured by Thomas are considered as a "degenerative form due to poorer social circumstances." Again, when discussing index-changes it is observed that the "increase of brachycephaly [might] be due to a greater vitality of the higher index race compared to the perhaps somewhat asthenic lower index people, prevailing length-growth being an asthenic feature." With brachycephaly once achieved, its spread is easily explained by Frets' statement of brachycephaly as dominant in a cross.

Professor Kappers has offered us a brilliant demonstration of method; his thesis is ever pursued to its logical conclusion. Though his wealth of detail is at times embarrassing he has done more than introduce us to the anthropology of the Near East: he has lead us along the avenues of race-movement and has explored with us the little-known paths of race-trend; far more he has opened the way for further study, and has challenged the historo-anthropologist to a renewed effort to disentangle racial strains in the Near East.

In his contribution to the serology of the Near East Dr Parr offers conclusions based on blood-typing data from 7823 individuals of Western Asia and North Africa. After an initial warning that "similar possession of blood type racial formulae does not prove relationship but only like possession of isohemagglutination factors" he states that "blood typing work properly carried out and interpreted may materially assist the older methods of Anthropology in the study of race groups."

The blood-grouping carried on by Dr Parr substantiates Professor Kapper's conclusions as to the kinship of the Hittites, Khaldeans, Armenians and Lebanese. The Egyptians are placed in the Hunan group of Snyder and "some of the Persians" are identified with the Adnan Arabs. Of the Jews it is concluded that "there is serological evidence that the Jews are a religion rather than a race."

The Samaritans, who are classed by Professor Kappers as "Hebrew Semites," are "immunologically unlike any of the existing surrounding groups whom they might reasonably be presumed to resemble." This is probably due to very intensive inbreeding, a fact, which caused Dr Parr to conclude that "the value of blood-typing tests in anthropological studies is very little when the group studied is highly isolated."

The serologist offers his services to the anthropologist. Dr Parr exemplifies the caution necessary in the interpretation of the correlation of apparently related data. His conclusions gain the more because of his reservations.

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MISCELLANEOUS

Property Restrictions as Survivals of Primitive Communism. D. K. ZELYENIN. (Transactions of the Institute of Anthropology and Ethnography, Vol. 1, No. 1. 75 pp. Roubles 2.25. Leningrad: Academy of Sciences, 1934 [In Russian].)

Professor Zelyenin adheres closely to the present theoretical position of Soviet ethnography. This position is based on Engel's views of the origin of private property, the family and the state, which in turn were strongly influenced by Lewis H. Morgan's evolutionary theories of social development. The current Soviet belief is in an original universal condition of "primitive communism," a pre-class society which developed universally through various definitely characterized stages to feudal and then capitalistic social forms. Hence a large part of ethnographic research is devoted to finding survivals of earlier stages.

In the present work the author quotes numerous instances, mostly from groups in Russian territory, of restrictions on the right of individuals to do as they wish with their property. "Property restrictions" is defined as a "prohibition on giving away one's own possessions for temporary or permanent use to strangers," meaning by strangers anyone outside the "in-group." Professor Zelyenin then indicates that these restrictions are survivals from an earlier form of property ownership when the possessions in question were the common property of the group.

Numerous varieties of property restrictions both material and immaterial are compared. Restrictions on the use of magical power by the individual are particularly stressed as well as those on ceremonial and name privileges. Limitations on the use of the tribal fire are cited from various localities and carried down to the sacred fires of classical times. One section is devoted to traces of matriarchy as revealed in prohibitions on the use of property. The Marxian approach is emphasized in the section on restrictions covering the means of production and especially in the final paragraphs which consider property restrictions as weapons in the class struggle.

Most of the material is taken from Russian ethnographic accounts though there are a few examples cited from such sources as Frazer and Crawley.

ALFRED E. HUDSON

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The Earliest Relations Between the Celts and Germans. C. S. ELSTON. (London: Methuen and Co., 1934.)

To anyone who is concerned primarily with modern ethnology, linguistic paleontology must seem an adventure among possibilities of past events and past relationships rather than an encounter with cultural data. One of the possibilities which adventurers preceding Dr Elston found was that Celtic overlordship characterized the earliest relations of Celtic speaking and Germanic speaking peoples. Inferences of such an overlordship were based almost exclusively on the peculiar sort of circumstantial evidence which linguistic paleontology supplies. Dr Elston does not eschew such evidence, but uses it cautiously. Even such a generally accepted point

as that *rīks is borrowed from Celtic is shown to be not entirely certain (p. 166). And less certain borrowings of Celtic words and concepts by Germanic are shown to be definitely wrong. On the whole, the book indulges in consistently negative criticisms in this respect. Germanic culture was not dominated by Celtic culture; the most that can be said is that certain cultural contacts existed between the right and left banks of the Rhine, presumably commercial, possibly turbulent.

Here we have what so often happens when circumstantial evidence is used exclusively. There are imaginable alternatives. One linguist finds reason to expect a Celtic overlordship; another says that nothing more than trade relations can be supposed. And precisely those scholars who are apt to be most interested in the ethnological relationship are often incompetent to make independent decisions in the type of linguistic controversies which follow. It is no wonder that ethnologists generally regard the evidence presented in linguistic paleontology without great enthusiasm.

Dr Elston, however, does something which is rare enough to give the impression of a new methodology. He reviews all the relevant historical and archaeological data which he is able to find. These data constitute direct evidence. They suffer in being few, sporadic, and inconclusive by themselves. But combined with the circumstantial evidence of words which Germanic borrowed—or did not borrow—from Celtic, the thesis of the book is so fortified that alternative possibilities are ruled out.

Negative theses such as Dr Elston's, however clearly demonstrated and valuable, have not the compelling interest of positive descriptions. It is to be hoped that Dr Elston will in future apply his method in a study of, say, the earliest relations between Hittite speaking and Indo-European speaking peoples. Comparable studies in America, adventurous as they may seem to contemplate, might prove crucial in situations where the isolated attack of ethnology, archaeology, or linguistics yields only conjecture.

C. F. VOEGELIN

YALE UNIVERSITY

The Ape and the Child: A study of environmental influence upon early behavior. W. N. AND L. A. KELLOGG. (xiv, 341 pp., illus. $3.00. New York: Whittlesey House, McGraw-Hill, 1933.)

How would a baby ape behave if she were reared in a family of human beings and treated as if she were one of them rather than an animal pet? To answer this question Professor and Mrs Kellogg kept a baby chimpanzee in their home for nine months, and treated her, as nearly as possible, as they did their only child, a baby boy two and one-half months older than the ape.

They found that the ape, treated as a child, behaved very much as a child. With regard to clothing, bathing, eating, playing, etc., the ape and the child were very much alike. In her social behavior, too, the little chimpanzee was strikingly "human:" she was affectionate, dependent upon friendly and protective companionship, liked to "show off," was jealous of attention paid to others, etc. Indeed, the

authors felt that in many respects the ape had become more "humanized" than the child (p. 315). The ape learned to do many things before the child did. In some cases this was due to her greater physical maturity, although more than two months younger. But in other situations her superiority did not rest upon physical prowess, as, for example, her superior comprehension of words and phrases and in her better mastery of eating with a spoon.

The child, in his turn, was affected by companionship with the ape. He attempted to emulate her feats of climbing, and frequently imitated her "food bark."

The authors emphasize their conviction that it was not merely living in a house in contact with human beings that made the ape's behavior what it was. It was participating in the intimate socio-psychological intercourse of the family that "humanized" her. And it is this characteristic that makes the Kellogg's experiment differ from all others conducted with apes, so far as the reviewer is aware.

A word of caution might be injected by the reviewer concerning the use of the word "human" in connection with the ape's behavior. Although she behaved like the child her behavior cannot, strictly speaking, be called human. Neither can the behavior of the child before speech is acquired. Human behavior may be said to be primate behavior in which symbolizing (articulate speech, or some other form) plays a part. According to this criterion, the behavior of both ape and child was merely primate behavior, not human behavior. Moreover, the experiment showed quite clearly that the ape has no potential capacity for articulate speech (symbolizing, and hence, human behavior). What we have in this experiment, then, is not an instance of "humanization" of an ape, but a demonstration of the fact that speechless, infant primates of different, but morphologically similar, families will behave very much alike in similar physical, social and psychological situations.

Professor and Mrs Kellogg deserve much credit for this patient and painstaking study. Their story is told with a vivid intimacy that is delightful, and withal, a sober scientific weighing of judgments. *The Ape and the Child* is an important contribution to the study of primate psychology and behavior.

LESLIE A. WHITE

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DISCUSSION AND CORRESPONDENCE

MAMMOTH OR "STIFF-LEGGED BEAR"

In a recent number of the AMERICAN ANTHROPOLOGIST[1] an article by Dr W. D. Strong brought to light some interesting and supposedly significant interpretations of tales which he recorded among the Naskapi Indians of Labrador. The purport of Dr Strong's conservatively phrased presentation was to contribute to a discussion which he, as well as others for over a century, has maintained as concerns the memory in native tradition of the actual existence of the mammalian monster in post-Pleistocene times. Dr Strong quoted me as one of his sources for contributory data obtained during my research among the Penobscot of Maine, which is cause at the present time, I take it, for reverting to the material and commenting upon opinions contained in his article. And in addition there is something more to be said.

The Naskapi tales which he gives are versions of a narrative widely known among the northerners, of which I have taken some examples that should be included in the series as a prelude to the judgment that I feel urged to give on the matter in question. The following tale from the Mistassini band of Naskapi in the interior of the Labrador peninsula is one to add to the list of versions which Dr Strong refers to in his compilation of published and unpublished occurrences. The tale described events attributed to the career of Tsəka'bec, the trickster-transformer of the northern Algonkian, in which a monster beast known as Katci·to'wɑck'ʷ appears as a man-eating colossus, elephantine in size and, according to Dr Strong, in its implied zoological characteristics. The term Katci·to'wɑck'ʷ is translatable as "Stiff-legged Bear," and is recognized by interpreters of both Naskapi and Montagnais proficiency as being referable to an animal of the Ursidae.[2]

The tale as recorded in text from the late ex-chief of the Mistassini band, Charlie Metowecic, is as follows.[3]

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[1] W. D. Strong, North American Traditions Suggesting a Knowledge of the Mammoth (American Anthropologist, Vol. 36, 1934), p. 81.

[2] The proper name as given extends entirely across the Cree, Montagnais-Naskapi area without much dialectic variation. Its analysis is as follows: tci·towa'o, "he is stiff," referring to an arm or leg;—ɑck, final position stem substantive for "bear," viz. mɑck'ʷ, "bear," wapɑck'ʷ, "white bear," natɑckwa'n, "where they hunt the bear" (Natashkwan, a Montagnais-Naskapi band and place name on north shore of the Gulf of St. Lawrence).

[3] Some rather trivial personal circumstances surrounding the so-called "mammoth" quest among the Montagnais-Naskapi may be interesting enough to insert here. It happened that I was staying with the Indians at Lake St. John in the winter of 1930 engaged in a research task supported by the Faculty Research Fund of the University of Pennsylvania, when Dr Strong released to the newspress (Boston Sunday Post, Jan. 12, 1930) his notes and opinions which lead to the public impression that the mammoth was a contemporary of man in North America. A telephone message from the Boston Post called me to the trader's store from one of the camps asking for confirmatory evidence. The response, declined at the time, is given now. The message, however, had an effect. It provoked a discussion over the subject with two chiefs of the bands present, bringing forth during the course of the night session the results embodied in these notes.

Katci·to'wɑck'ᵂ, The Stiff-Legged Bear

Tsɔka'bec was living near a mountain with his sister. Every time he started to go hunting he would begin to sing and so she would know he was about to leave. This time she began to fear for him and said "Don't go over that mountain or you will be killed. There is a monster living there who eats people." "Do not say that," he replied. "Every time you tell me not to go somewhere it makes me afraid. Why do you not want me to go over there? What people has the great beast eaten?" "He has killed and eaten our dear parents," said his sister. "Oho! How can he be known, and what is he called?" added Tsɔka'bec.

"He is very large, as large as that rock, and he is called Katci·to'wɑck'ᵂ, 'stiff-jointed bear.'[4] Do not go over there because he will eat you too and then I will be alone," and she began to cry. Tsɔka'bec, however, took his bow and arrows and went over the height of land to the place where the monster was said to live. When he got to that country, he went along looking for signs of Katci·to'wɑck'ᵂ and singing his hunting song, "Stiff-jointed bear, I am hunting him," over and over. At last he met a great white beast, and prepared to attack him. "Are you Katci·to'wɑck'ᵂ?" he asked him. "No, I am not. I am White Bear." "Oh, then you are not the one I am looking for," said Tsɔka'bec. "Where can I find him?" "He lives farther on, and is very dangerous. No arrow can kill him and if you go there he will eat you as he has others." "I am not afraid of him. I am going to attack him," and Tsɔka'bec went on singing his hunting song. At last he found Katci·to'wɑck'ᵂ. He was as big as a hill of rock. Said Tsɔka'bec, "Are you Katci·to'wɑck'ᵂ?" "Yes," answered the beast, "Why do you come here? Do you not know that you will be eaten?" "No, I will not be eaten, I have come here to kill you. I am Tsɔka'bec." "You can not kill me with your arrow. Do you see that tamarack tree there? I am tougher than that, and your arrow will break to pieces when you shoot." "If that is all," said Tsɔka'bec, "My arrow will kill you. See that," and he shot an arrow into the tree and the tree shattered to fragments. "Well now," said Katci·to'wɑck'ᵂ, as he began to be afraid, "I am even tougher than that rock." He pointed toward a rock nearby. Then Tsɔka'bec said, "I can kill you even so," and he shot his second arrow at the rock and the rock broke into pieces. With this Katci·to'wɑck'ᵂ became frightened and ran away to escape. Then Tsɔka'bec quickly went to the rock and pulled his arrow out, and shot in the direction of the running beast without even being able to see him. So good was his aim that it struck the monster and he fell down dead. Tsɔka'bec followed after and there he found Katci·to'wɑck'ᵂ shot dead with the arrow. Then he took his knife and cut him open to see if he had eaten their parents. When he cut Katci·to'wɑck'ᵂ open he found in his stomach two bunches of hair, one a man's tied behind with the "hair-tie," the other a woman's tied on each side with the woman's "hair-ties."[5] Then he took the hair-ties and started back to his camp. When he came, his sister was waiting for him. He showed her the hair-ties and she knew by them that Tsɔka'bec had killed the monster who had eaten their parents.

The trend of opinion among the informants is that the tale in question relates to a carnivorous monster of the bear kind living in a former age when Tsɔka'bec was upon earth. A mythological creature! And with this view I coincide.

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[4] The Montagnais living nearer to the settled country, who have seen pictures of animals of the world, give this name to the elephant. I found one hunter who had seen an elephant himself and said it was correct.

[5] The Montagnais and Naskapi women wear their hair fastened on a small block of wood over each ear, bound with a wrapping of braid or woven bead strips.

Indulging in a glance again at the reference to the supposed "mammoth" of Wabanaki mythology to which Dr Strong gave some attention, I would like to order the analysis of the native term denoting the monster as it appears in several tales recorded in Penobscot text. An English version of the legend of White Owl, containing reference to the hairy stiff-legged monsters, was published some years ago and to which I would point attention at this time.[6] The translation is quoted below. Much significance, however, lies in the fact that the beast is called Ktci·awa′s, "Great Beast." It also happens that in another tale dealing with the career of the Penobscot hero-transformer Gluskœbe,[7] the animals of the earth are receiving for the first time their human designations. A "great beast" (ktci·awa′s), which Gluskœbe slays, is brought to his patron grandmother for identification. She declares it to be of the bear kind. This links the generic awa′s, "beast," with the ordinary term in the Wabanaki languages for "bear," namely awa′s·u′s (St. Francis Abenaki), awe′s·sus, (Penobscot). (Penobscot replaces St. Francis a in general with e.) Here, it seems we have the coincidence of terms and identities of the mythical behemoth in question with Ursine monsters of mythical narratives—creatures of as fantastic an origin as the episodes of the tales themselves.

The pertinent sections of both the Penobscot and Naskapi (Mistassini) tales alluding to the "Great Beast" are now given as my final contribution to the interesting and no doubt important discussion evoked by Dr Strong's compilation of evidence in story for palaeontological identification.

I may point out that the Penobscot tale is somewhat more explicit as to the physical peculiarities of the "Great Beast" in that its shaggy hair and its habits of leaning against trees for repose, since its legs were stiff-jointed, preventing it from rising again should it ever fall or lie down, are mentioned definitely. In another narrative the beast is described as having teeth long enough to pierce seven hunters, a lip long as "seven paces," and an unconquerable strength until destroyed by the will of Gluskœbe "never to be seen by any of my children (the Indians)." Nicolar, the author of the tale, denotes the beast a mammoth, par-sar-do-kep-piart, a term which as yet baffles analysis.[8] In the Montagnais-Naskapi tales these details are wanting, and the informants when asked did not know more than that the creature was "stiff-legged" by tradition.[9] The legend is evidently a very old property of the Algonkian of the northeast on both the Atlantic and St. Lawrence coasts, losing some of its particulars in the course of time as transmitted among separated groups of the people in Maine and in the Labrador peninsula.

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[6] F. G. Speck, One of Caesar's Anecdotes among the Indians of Eastern North America (The Alumni Register, University of Pennsylvania, Vol. 19, No. 9, June 1917, pp. 686–90).

[7] F. G. Speck, Penobscot Transformer Texts (International Journal of American Linguistics, Vol. 1, No. 3, 1918), p. 190, line 7.

[8] Joseph Nicolar, The Life and Traditions of the Red Man (Bangor, Me., 1893), pp. 36–38.

[9] As to having long tusks the informants knew only of the walrus (wi·pitco′, "toothed") as such a creature in Naskapi.

White Owl, His Escape from the Witches and the Great Beasts[10]

There was a village divided into two parts, one a quiet part and the other a boisterous part, the latter abusive to the former. Here lived a family in which there was a son named Snowy Owl. At last the family moved away to a divide in the mountains and finally the father and mother died. Snowy Owl was instructed by his dying father to send his "spirit helper" to tell his grandmother that he would come to live with him. This was done and the grandmother became the foster parent of Snowy Owl. One day she gave Snowy Owl his grandfather's bow and arrows which consisted of some pieces of ivory which she put together, telling him that whatever he shot at his arrow would not miss. Snowy Owl next started out to find the camps of human beings to get him a wife. He traveled far to the south, and on the way noticed how the lakes and rivers were drying up. Desiring to learn the cause of the water shrinkage, he ascended the valleys and finally reached a place where he saw what he thought were hillocks covered with brown vegetation moving slowly about. Upon closer scrutiny he learned that these masses were really the backs of great animals with long teeth, *animals so huge that when they lay down they could not get up.*[11] He saw that they drank for half a day, thus taking up all the water in the basins of the land. Snowy Owl decided that some day he would have to kill them.

He journeyed on and came to a place where a great witch lived with her seven beautiful daughters. Whenever these women desired food the daughters went abroad and lured suitors to come home to marry them. On the night of the marriage it was their custom to tell the husband-to-be that he should have his hair combed. Whereupon they combed his hair and combed out his brains with a magic comb, eating the brains from it. The pain could not be felt. When at last the victim cried "Pi u!" they sent him out, where he traveled to the north and lived with the great white rabbit. (This creature lives on a high peak, always surrounded by snow where no one can reach him. When he sees anyone coming he causes it to snow until the visitor is overwhelmed. Only those who have had their brains combed out are allowed to come, whereupon they are transformed, like their overchief, into white rabbits and live on grass.) The youngest daughter of this family, who had never yet had a husband, fell in love at once with Snowy Owl, and knowing the fate intended for him, decided to spare him and escape with him. The mother of the girls was a "night witch" who had no power during the day. Now, the girl made caps for her mother and sisters and told them they were to wear them to celebrate her wedding that night. When they put them on they fell asleep. Snowy Owl and the girl at once took flight. They ran all day, followed by the cry of the old witch, harmless during daylight, "You can't escape me, for I'll get you tonight." At last the pair came to a big wigwam and asked the old man to help them in their flight. This was the wigwam of "Great Star," known as the Morning Star. (He is said to sleep so late that he is the last star to retire in the morning.) He took them in and hid them. When night came the old witch started in pursuit and reached "Great Star's" wigwam, asking him about the pair. "All right," said he, "my dog and I will help you. But wait till I put on my moccasins, my coat, my leggings my belt." He was very slow, and took so long a time to put on his things that when he opened the door of his wigwam there stood the Morning Star. Night was over and the old woman became powerless for the day. The pair then fled to the north where the seven Thunder Brothers live. When they arrived at the home of the Thunders, one of them said to another,

[10] Narrated by Newell Lion. The informant mentioned that a similar tale is known to the Passamaquaddy Indians at Eastport, Maine.

[11] Ktci·awa's, "Great Beast." This is not the specific name in Penobscot of any existing animal.

"Open your eye only a little to see who is coming." He opened his eye a little and the lightning flashed forth from his lids, but not enough to hurt the lovers. They were taken in and when night fell the old witch came likewise. Whereupon the seven Thunders opened their eyes wide, the lightning flashed and shattered the mother witch to pieces. Now, Snowy Owl and his wife settled down in safety.

Snowy Owl proceeded then to find the monsters which he had seen before. He went to where the animals had their "yards." He cut certain trees, where he had observed the monsters were accustomed to lean for rest at night, almost through, so that when the monsters would lean on them they would break. When the creatures went to rest at night leaning against the trees, they fell upon the sharpened stumps when the top bent over and broke, and could not get up again; and Snowy Owl shot them all.

Thereupon the water basins filled up again and water became plentiful. Snowy Owl and his wife returned to the village and the people were glad to welcome him for what he had done, and they made him their chief.

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ONCE MORE MASCOUTENS

It would be easy to give several additional references showing that the Mascoutens could not possibly be the same as the Potawatomi,[1] but perhaps it as well to restrict these to a letter of Du Chesneau, dated Nov. 13th, 1681, in P. Margry's Découvertes et établissements des Français dans l'ouest et dans le sud de l'Amérique Septentrionale (1614–1764) (Paris, 1875–86, Vol. 2), "du costé du Sud, des Sakis, des Poutoutamis, Puants, Oumalominis ou de la Folle-Avoine, Outagamis ou Renards, Maskoutens, Miamis et Islinois;" to an English translation of Duquesne's letter to Machault, Quebec, dated October 13th, 1754, in Documents relating to the colonial history of the state of New York (Vol. 10: 263), "Poutwatamis, Kickapoux, Mascoutins and Scioux of the prairies, have assembled together to go and destroy the Peorias;" and to an English translation of a letter of Father Marest, dated at Kaskaskia, Nov. 9th, 1712, *apud* J. P. Dunn, Jr. (Indiana, Boston and New York, 1905, pp. 36, 37), "Father Mermet was sent to them. This father thought he ought to labor for the conversion of the Mascoutins, who had made a village on the banks of the same stream—this is an Indian nation using the Illinois language." In this connection it may be well to make some additional quotations from Forsyth: "a numerous nation of Indians who called themselves Linneways and called by other Indians, Ninneway (literally, men) this great nation of Indians were divided into different bands . . . Michigamians . . . Cahokians . . . Kaskaskias . . . Tamorois . . . Piankishaws . . . Weahs . . . Miamies . . . Peorias (being another band of the same nation) lived and hunted on Illinois River: also the Masco or Mascotins called by the French Gens des Pirarie lived and hunted in the great Piraries lying between the Illinois River and the Wabash, etc." (see Forsyth, *apud* Blair, Indian Tribes of the Upper Mississippi and Great Lakes Region, Cleveland, 1912, Vol. 2:

[1] See American Anthropologist, Vol. 36: 226–33, 1934.

200–201). "The Sauk and Fox . . . were attacked by a party of Mascota or Mascotins. . . . The Sauk Indians attacked a small village of the Peorias" (Forsyth, *loc. cit.*, pp. 202, 203). Incidentally I may note that on p. 178 of Margry, Vol. 2, in a letter of La Salle (which letter is of uncertain date, apparently in 1681) we learn of a Mascouten chief "Un Sauvage nommé Kiskirinanso ce que veut dire 'Bœuf sauvage coupé.'" If this personal name is reasonably well recorded (confirmed as far as the vital point is concerned by Kikirinous, given by La Potherie, *apud* Blair, Vol. I: 370; Miss R. Flannery tells me this is not a misprint) we have linguistic proof of the Illinois affiliations of the Mascoutins. The word corresponds to the Fox personal name Kī'ckinenu'swa which belongs to the Bear gens.

Ma'cktä'ag$^{ki'}$ (American Anthropologist, Vol. 36: 229) is a misprint for Ma'ckutä'ag$^{ki'}$.

Wallace A. Brice in a footnote on p. 3 of his History of Fort Wayne (Fort Wayne, 1868) says, "The Mascoutens, says Gallatin, dwelling about Lake Michigan, were a branch of the Miamies." Gallatin says nothing of the sort (see p. 61 of his Archaeologia Americana, Amer. Antiq. Soc. Transactions and Collections, Vol. 2, 1836): "The name 'Mascontens' was therefore used to designate 'prairie Indians.' And it appears that they consisted principally of Sauks and Kickapoos, with an occasional mixture of Potawatomies and Miamies. . . ."

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THE INTERPRETATION OF MELANESIAN DESIGN: A REVIEW

Miss Gladys A. Reichard has given to students of art and to ethnologists a most valuable and sumptuously illustrated memoir on certain aspects of Melanesian decorative art.[1] Instead of elucidating the style of the decorative art of definite localities by a study of all kinds of objects, she has analyzed chosen specimens from a given locality which might be expected to typify the local style; this mode of approach was selected as the problem she set herself was primarily aesthetic rather than ethnological. With the richness of decorative art in Melanesia some selection was necessary and she adopted the following criteria:

1. The objects studied must be beautiful from my own point of view. 2. Each sort should have a fairly wide distribution. 3. There should be some overlapping in the occurrence of the objects chosen within a given area. 4. The art should be as free as possible from symbolic or religious significance since that may be understood only by questioning the natives.

The carved wooden bowls of the Admiralty Islands were chosen primarily for the study of the form; those of the Tami Islands (north of Huon Gulf) were found to be especially interesting on account of the elements and the composition of the

[1] Gladys A. Reichard, Melanesian Design: A Study of Style in Wood and Tortoiseshell Carving (I: Text, 172 pp., 75 figs., frontispiece, map; II: 151 pls. containing 600–700 figs. $10.00 New York: Columbia University Press, 1933).

designs. Widely distributed are the ornaments of turtleshell fretwork attached to a white shell disc: for these the name of kapkap is adopted from one of the languages of New Ireland. Some attention is also given to decorated lime-gourds. The selection is satisfactory for the purpose, but as Miss Reichard observes: "No matter at what point one starts, an intensive study leads into all sorts of byways."

It has long been recognized that it is possible, by its form and decoration, to allocate an unlabelled specimen to a definite area or people. Although two objects are seldom exactly alike, certain traditional conventions limit the artist from straying far afield. The artist works along lines within which he feels at home and which appeal from wont to his fellow countrymen, such for example as the choice of the elements of the design, their disposition with regard to the surface of the object, the use of rhythm, symmetry or asymmetry, symbolism, and so forth. Any of these principles may be worked out in a variety of ways according to the skill or originality of the artist, but always within definite limits. Occasionally the introduction of an alien form or design produces a disturbance in the local style and if permanently adopted creates a new style.

An attitude of sane scepticism is taken by the author in discussing the evolution of designs. It is pointed out that too many factors combine to make valueless the interpretation of forms by Europeans and I am incorrectly cited for an interpretation of a Tami design, though I admit I have in other instances ventured on suggestions. The author even rejects (p. 6) the explanation given by natives and recorded by careful observers, such for example as Dr W. G. Ivens. She says:

> these seem to me flights of fancy comparable to metaphor and figure of speech in literature . . . Such poetic fancies seem to controvert the theory that primitives do not make abstractions. They are, however, independent of the forms to which they are attached and comparisons of form and significance should be kept separate.

But one of the instances she contemns is a realistic diagram of a waterspout given by Ivens. More respect is paid to the conclusions of Dr H. Stolpe as "he had considerable experience with natives," but so had Dr Ivens and others also. It is possible that Miss Reichard would considerably modify her views if she could do field-work in Melanesia. Any field-worker will acknowledge that apparently contradictory explanations are sometimes given for the same design. This uncertainty may be due to the fact that these informants do not know everything about the subject or that they may be reluctant to tell; at all events it may be admitted that the artist himself generally knew more or less what he was doing. On the other hand it is recognized that in some cases the design has so long been conventional that it has ceased to have a definite meaning and it is possible it may never have had one.

Dr Preuss correctly identified a certain representation as a hanging Pteropus and he allocated to this motif a series of stylized designs. Miss Reichard (p. 16) says: "Many scientists . . . regard the pattern with the two upcurved elements always as the 'flying dog.'" So far as I am aware only Preuss has studied this design—the characteristic feature of which is the downturned wings—and neither he nor anyone else has correlated it with the Admiralty design. She adds: "those ele-

ments may be only *names* and not symbols in any sense of the word, in which case my 'fleur-de-lis' label is as good as some one else's 'flying dog.'" We are dealing here with only one name which has been applied to designs on the north coast of New Guinea. The term "fleur-de-lis" for a quite different design of the Admiralty Islands may be good enough as a label, but it is meaningless so far as Melanesia is concerned. It is probable that these two designs, like very many others, are symbolic, but that does not prevent either from being "also regarded as a decorative motive, the elements of which may be played with and rearranged at will." When discussing the Santa Cruz kapkaps (p. 115), she is characteristically sceptical about the meaning of the design that is generally regarded as a frigate bird. She adds: "it is even probable that there might be none [no name] at all" for the design, which is doubtful. She also says Preuss "calls practically the same design 'the hanging Pteropus,'" but it is not "practically the same design," as the bat is hanging head downwards, and the forked tail of the frigate bird occupies the position of the head of the bat.

Miss Reichard (p. 7) evidently considers it futile to seek for origins. She says:

> The rewards of objective analyses are inherent in art itself. They consist of formulating the principles underlying the art style; the definition of elements, their combination into an organic whole; attitudes towards zones and fields, toward filling of spaces; preference for regularity, symmetry or asymmetry, or rhythmic repetition.

This defines her line of approach and she has carried out this new and profitable investigation with great skill. I must however confess that I cannot accept the argument of pp. 13, 14. It would seem that she analyzes the parts of a human or crocodile design into separate geometric elements and thinks the native artist regarded them as distinct art-forms; by playing about with them, they surprisingly became grouped into designs which resemble men or crocodiles. It is her considered opinion (p. 59) that "designs and elements are more formal than representative, and that they can be moved about in any combinations from man to fish to crocodile or lizard at will" and she points out "the possibility—strong probability—of development from geometric to representative rather than the reverse."

Despite her reluctance to deal with objects of a symbolic or religious significance, the author was forced to do so when dealing with the Tami bowls (p. 56). Our knowledge of Melanesian symbolism is very imperfect, but we know enough to believe that it permeates a great deal of their decorative art. Miss Reichard's reticence is praiseworthy, as she does not want to make assumptions that cannot be proved, but most ethnologists will be of the opinion that to a considerable degree the decorative art has for the natives an emotional value which may aptly be termed religious. On the other hand there is no reason to believe that a large number of designs and patterns are otherwise than secular. As she puts it (p. 6): "ornamentation may be an outgrowth of pleasure in control of technique, it may be applied to purely utilitarian objects, or, it may, like sculpture, become social or religious."

The final chapter "General principles of Melanesian art" is a very valuable study which gives a great deal of information concerning the distribution of various motifs.

Naturally there are points upon which opinions may differ: to take but one, I doubt whether there is "adequate proof of influence [between Tami and the Massim] in both directions, if not intimate, then indirect," since the artistic "feeling" of the two areas is so very distinct; but this is not the place to enter into a detailed discussion. I would like to end up this review with recording my sincere congratulations to Miss Reichard on the able manner in which she has opened up a new method of approach to the study of Melanesian art, and incidentally to that of other peoples of analogous culture. The ethnologist has too frequently neglected the purely aesthetic aspect of native handicraft, and studies such as these are needed to rectify this omission.

ALFRED C. HADDON

CAMBRIDGE, ENGLAND

NOTES AND NEWS

THE REPORTS OF THE COMMITTEE ON STATE ARCHAEOLOGICAL SURVEYS, National Research Council, which in earlier years appeared in the AMERICAN ANTHROPOLOGIST, will be issued in the Circular Series of the Council. The full text of the report *Archaeological Field Work in North America, 1933* (Circular Series, No. 18) may now be obtained from the Division of Anthropology and Psychology National Research Council.

"VOYAGEURS, ROBES NOIRES, ET COUREURS DE BOIS: Stories from the French Exploration of North America," edited by Charles Upson Clark, has been brought to attention as a work especially well adapted to the needs of students acquiring a reading knowledge of French. It contains numerous excerpts relating to the Indians from the Jesuit Relations and Margry's "Découvertes," with partially modernized text and explanatory notes. (Published by the Institute of French Studies, Inc., 391 pp., $2.75: orders may be placed with Professor G. L. Van Roosgroeck, 504 Philosophy Hall, Columbia University, New York City.)

"DOCTORAL DISSERTATIONS ACCEPTED BY AMERICAN UNIVERSITIES, 1933–1934" (Donald B. Gilchrist, ed.), compiled for the National Research Council and the American Council of Learned Societies by the Association of Research Libraries, is a first complete annual list, with adjunct data on printing requirements, library loans, etc. The primary intent is that directors of graduate research be able to keep track of what is going on in the various fields in order to avoid duplication. (Published by the H. W. Wilson Company, 950 University Avenue, New York City; No. 1, xvi, 88 pp., $1 postpaid.)

DR MARTIN GUSINDE reports (August 29, 1934) that he and Dr Schebesta have been working for four months among the Pygmies of the upper Ituri. Dr Gusinde has also made somatological observations on the Batwa of Ruanda. Before leaving Mödling he completed, as a sequel to his Selk'nam (Ona) monograph, the manuscript of a second volume devoted to the Yamana (Yaghan). The series is to close with a third volume on the Halakwulup (Alakaluf) and the somatology of all the Fuegians.

DR MAURICE FISHBERG, chief physician of Montefiore Hospital, whose "Materials for the Physical Anthropology of the Eastern European Jews" was published as Memoirs of the American Anthropological Association, Vol. 1, No. 1, died suddenly on August 20th, aged 62.

WE DEEPLY REGRET TO ANNOUNCE THE DEATH OF DR ROLAND BURRAGE DIXON, Professor of Anthropology, Harvard University, on December 20th, aged 59.

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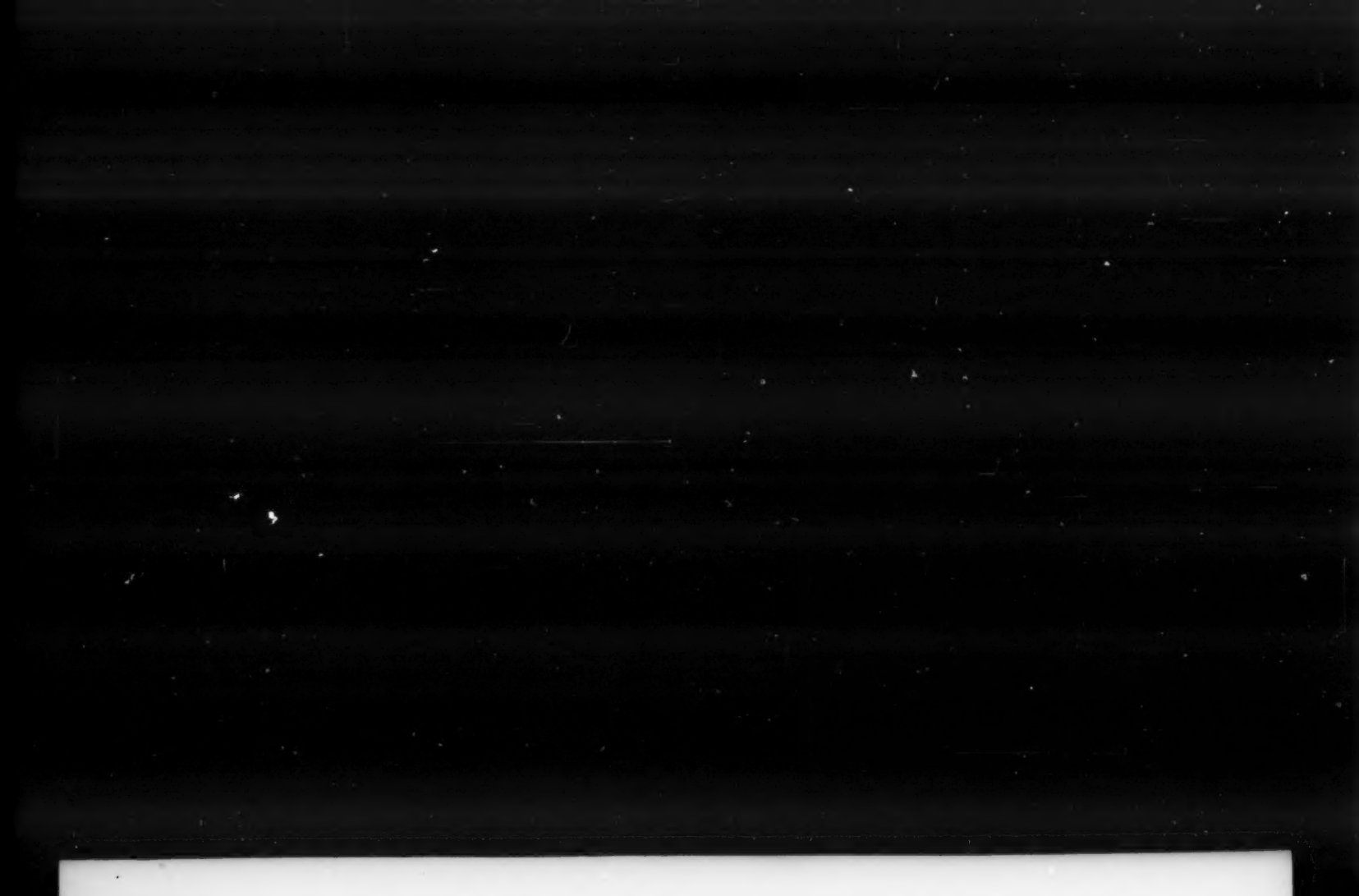
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